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DEPARTMENT OF THE INTERIOR,

CENSUS OFFICE.

ROBERT P. PORTER,
Superintendent.
Appointed April 20, 1889; resigned July 31, 1893.

CARROLL D. WRIGHT,
Commissioner of Labor in charge.
Appointed October 5, 1893.

REPORT

ON

MANUFACTURING INDUSTRIES

IN

THE UNITED STATES

AT THE

ELEVENTH CENSUS: 1890.

PART III.

SELECTED INDUSTRIES.

WASHINGTON, D. C.:
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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,
WASHINGTON, D. C., November 6, 1894.

SIR:

I have the honor to transmit herewith the Report on Manufactures, Part III, consisting of special reports on selected industries. The preparation of the schedules of inquiry and the collection of the data were conducted under the immediate supervision of Mr. Frank R. Williams, late expert special agent, who had charge of similar work at the Tenth Census, and Mr. George S. Boudinot, late chief of the division of manufactures. The tabulation of the data and the preparation of the statistical tables and such of the reports as are not credited to special agents, whose names immediately precede the respective reports, have been prepared by or under the direction of Mr. William M. Steuart, chief of the division of manufactures.

I am, very respectfully, your obedient servant,

CARROLL D. WRIGHT,
Commissioner of Labor in charge.

Hon. HOKE SMITH,
Secretary of the Interior.

TEXTILES.

COMBINED TEXTILES.
WOOL MANUFACTURE.
COTTON MANUFACTURE.
SILK MANUFACTURE.
DYEING AND FINISHING TEXTILES.

PRINCIPAL TEXTILE INDUSTRIES IN THE UNITED STATES.

BY S. N. D. NORTH.

The manufactures of wool, cotton, and silk are so closely allied to each other by general similarity of processes and machinery, and by the increasing interchangeable use of the fibers, that they may properly be regarded as constituting one general manufacture, to be considered not only separately, but also as a whole.

For the latter purpose tabulated statements containing the principal facts obtained at the Eleventh Census relating to these industries are herewith presented. Statements in detail for each principal branch of the industry will be found immediately following. For the purpose indicated it is necessary to include with the statistics of wool, cotton, and silk manufactures those of a closely allied industry, viz, the dyeing and finishing of textiles. The latter relates to the operations of independent dye works, bleacheries, and print works which are exclusively employed in finishing the products of woolen, cotton, and silk mills. The value of the product reported is simply the value added to the fabric by these final processes when conducted by distinct establishments. The other textile industries, the hemp, jute, and flax manufactures, and "mills employed in working raw cotton, waste, or cotton yarn into hose, webbing, tapes, fancy fabrics, mixed goods, or other fabrics, which are not sold as specific manufactures of cotton or wool", reported as "Special mills" in 1880, were treated at the census of 1890 with less particularity of detail upon the general manufacturing schedule, and the results will appear in the reports containing general statistics of manufactures under different heads, the most important of which are awnings, tents, and sails; baggings, flax, hemp, and jute; bags, other than paper; belting and hose, linen; belting and hose, rubber; carpets, rag; cordage and twine; cotton waste; gloves and mittens; hand knit goods; jute and jute goods; linen goods; rubber and elastic goods; thread, linen; upholstery materials.

As a preliminary exhibit of the growth of the textile industry of the United States, a table is first presented, covering the main statistics for a period of forty years as reported at the censuses of 1850, 1860, 1870, 1880, and 1890. This table shows the total number of establishments engaged in each of the textile manufactures and in dyeing and finishing, the amount of capital, number of employés, amount of wages, cost of materials, and value of manufactured products.

TABLE 1.—COMPARATIVE STATEMENT OF COMBINED TEXTILE INDUSTRIES IN THE UNITED STATES: 1850–1890.

INDUSTRIES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES		Cost of materials used.	Value of products.
				Employés.	Wages.		
Combined textiles	1850	3,025	$112,513,947	146,897	(a)	$76,715,959	$128,769,971
Wool manufacture (b)	1850	1,760	32,516,366	47,763	(a)	29,246,696	49,636,881
Cotton manufacture	1850	1,094	74,500,031	92,286	(a)	34,835,056	61,869,184
Silk manufacture	1850	67	678,300	1,743	(a)	1,093,860	1,809,476
Dyeing and finishing textiles	1850	104	4,818,350	5,105	(a)	11,540,347	15,454,430
Combined textiles	1860	3,027	150,080,852	194,082	$40,353,462	112,842,111	214,740,614
Wool manufacture (b)	1860	1,673	42,849,932	59,522	13,361,602	46,649,365	80,734,606
Cotton manufacture	1860	1,091	98,585,269	122,028	23,940,108	57,285,534	115,681,774
Silk manufacture	1860	139	2,926,980	5,435	1,050,224	3,901,777	6,607,771
Dyeing and finishing textiles	1860	124	5,718,671	7,097	2,001,528	5,005,435	11,716,463
Combined textiles	1870	4,790	297,694,243	274,942	86,565,191	353,249,102	520,386,764
Wool manufacture (b)	1870	3,456	132,382,319	119,859	40,357,235	134,154,615	217,668,826
Cotton manufacture	1870	956	140,706,291	135,369	39,044,132	111,736,936	177,489,739
Silk manufacture	1870	86	6,231,130	6,649	1,942,286	7,817,559	12,210,662
Dyeing and finishing textiles	1870	292	18,374,503	13,066	5,221,538	c99,539,992	c113,017,537

a This item was not fully reported at the census of 1850.
b Includes hosiery and knit goods.
c At the census of 1870 the value of the fabric itself was included, whereas at all subsequent censuses merely the values added to such fabrics by the processes of dyeing and finishing are given.

TABLE 1.—COMPARATIVE STATEMENT OF COMBINED TEXTILE INDUSTRIES IN THE UNITED STATES: 1850–1890—Cont'd.

INDUSTRIES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
Combined textiles	1880	4,018	$412,721,496	384,251	$105,050,666	$302,709,894	$532,673,488
Wool manufacture (a)	1880	2,689	159,091,869	161,557	47,398,087	164,371,551	267,252,912
Cotton manufacture (b)	1880	756	208,280,346	c174,659	42,040,510	102,208,347	192,090,110
Silk manufacture	1880	382	19,125,300	31,337	9,146,705	22,467,701	41,033,045
Dyeing and finishing textiles	1880	191	26,223,981	16,698	6,474,364	13,664,295	32,297,420
Combined textiles	1890	4,114	d739,973,661	511,897	175,547,343	421,398,196	721,949,262
Wool manufacture (a)	1890	2,489	296,494,481	219,132	76,660,742	203,095,572	337,768,524
Cotton manufacture	1890	905	354,020,843	221,585	69,489,272	154,912,979	267,981,724
Silk manufacture	1890	472	51,007,537	50,913	19,680,318	51,004,425	87,298,454
Dyeing and finishing textiles	1890	248	38,450,800	20,267	9,717,011	12,385,220	28,900,560

a Includes hosiery and knit goods.

b In addition to these data there were received at the census of 1880 returns for 249 mills classed as "Special mills", engaged in working raw cotton, waste, or cotton yarn into hosiery, webbing, tapes, and fancy fabrics, and mixed goods or other fabrics which are not sold as specific manufactures of cotton or wool. These 249 establishments reported $11,224,448 capital, 12,928 employés, $3,573,909 wages, $2,338,385 cost of cotton consumed, $18,860,273 value of products, and should be considered in making comparisons. In 1890 this class of mills is reported under a number of different heads, enumerated on page 3, although some of them may be included in the totals for the textile industries presented in this report.

c Includes 2,115 officers and clerks, whose salaries were not reported.

d Value of property hired is not included in the capital reported in 1890 because it was not included in the reports of previous census years.

While the incomplete character of earlier census inquiries renders their comparison with the more detailed results of later investigations somewhat misleading, still the general results shown in the foregoing table present a picture of wonderful development. Since 1850 the capital employed in the textile industry has increased nearly seven times, and the value of products nearly six times. The number of employés has increased from 146,897 to 511,897. The amount paid in wages was not fully reported in 1850, but the increase from 1860 has been nearly four and a half times.

VALUE OF PRODUCTS.

The development of the textile industry has been uninterrupted. The combined industry produced in 1890 goods valued at $721,949,262, the largest percentage of increase, as measured by the value of products, occurring during the decade 1860–1870. But in order to correctly obtain the statistical measure of this growth, account must be taken of the fact that the value of product reported in 1870 was a currency value at a time when the paper dollar averaged 79.81 cents in gold, and the prices of all raw materials were correspondingly high. In making comparisons with the data for the census of 1870 this fact must be remembered, and all values reported at that census reduced to a gold basis. Another fact having a like bearing upon the true measure of growth is the steady decline in the market value of products which has been in progress since the census of 1870 was taken. This decline has been accelerated in each branch of textile manufacture by remarkable improvements and advances in labor saving machinery—improvements which partially equalize the advance in wages which has taken place. These mechanical improvements have not radically changed the principles of mechanism employed in the United States during the last thirty years, but they have greatly simplified and expedited processes, and reduced the labor required to produce a given amount of product. The percentages of increase in number of employés and value of products, after reducing to a gold basis the currency value reported for 1870, are as follows:

PERCENTAGES OF INCREASE IN AVERAGE NUMBER OF EMPLOYÉS AND VALUE OF PRODUCTS.

PERIODS.	Employés.	Products.
1850 to 1890	248.47	460.65
1850 to 1860	32.12	66.76
1860 to 1870	41.66	93.41
1870 to 1880	39.76	28.26
1880 to 1890	33.22	35.53

The differences between the percentages of increase in the value of products and in the number of employés indicate in a measure the increase in efficiency of machinery, although many different elements affect both percentages.

THE GROWTH BETWEEN 1880 AND 1890.

The statistics relating to the years 1880 and 1890 contained in the preceding tables are shown in Table 2 in direct comparison by totals for each state, and for geographical groups of states.

TABLE 2.—COMPARATIVE STATEMENT OF COMBINED TEXTILE INDUSTRIES IN THE UNITED STATES, BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1890 AND 1880.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital. (a)	Miscellaneous expenses. (b)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
					Employés.	Wages.		
United states	1890	4,114	$739,973,661	$43,356,736	511,897	$175,547,343	$421,398,196	$721,949,262
	1880	4,018	412,721,496	.....	c384,251	105,050,666	302,709,894	532,673,488
New England states	1890	1,210	426,365,388	24,501,029	259,542	91,888,951	211,974,959	365,613,324
	1880	1,214	261,561,147	.....	217,674	60,611,202	172,223,778	310,542,352
Maine	1890	107	30,990,097	1,867,550	20,011	6,579,880	14,495,290	24,911,165
	1880	126	19,932,406	.....	15,869	4,204,778	12,148,526	21,470,567
New Hampshire	1890	118	43,891,412	2,339,287	29,573	10,044,132	22,225,159	37,256,364
	1880	126	31,247,024	.....	24,743	6,904,069	18,809,037	32,757,353
Vermont	1890	45	5,491,250	301,466	3,040	1,116,026	2,626,232	4,744,326
	1880	58	3,750,257	.....	3,204	807,048	2,881,935	4,671,041
Massachusetts	1890	533	215,254,813	12,930,047	126,819	45,590,207	107,465,624	184,938,074
	1880	496	120,443,376	.....	106,743	29,801,016	84,228,717	152,988,522
Rhode Island	1890	204	70,699,470	4,260,785	48,071	16,835,284	37,911,493	67,005,615
	1880	194	46,989,447	.....	36,622	10,127,287	27,708,649	51,383,569
Connecticut	1890	203	60,038,346	2,801,894	32,028	11,723,422	27,251,161	46,757,780
	1880	214	39,198,637	.....	30,493	8,766,404	26,446,914	47,271,300
Middle states	1890	1,914	222,402,855	14,352,458	185,136	67,512,602	161,124,539	279,576,396
	1880	1,540	115,483,359	.....	132,884	38,013,381	106,328,538	183,443,725
New York	1890	615	75,881,672	4,840,584	62,383	22,663,753	47,621,495	86,171,293
	1880	480	42,022,987	.....	45,153	12,652,423	30,610,901	56,191,417
New Jersey	1890	240	43,321,016	2,952,104	34,712	13,704,395	29,682,210	52,831,023
	1880	186	16,028,770	.....	24,111	7,652,833	17,456,679	31,865,348
Pennsylvania	1890	1,010	92,686,227	6,052,430	81,381	29,236,630	78,869,158	132,367,499
	1880	822	51,238,747	.....	58,005	16,560,274	53,999,549	88,594,143
Delaware	1890	11	2,555,233	122,690	1,543	546,117	1,007,270	1,821,278
	1880	13	1,227,129	.....	1,058	301,231	975,490	1,536,260
Maryland (d)	1890	38	7,958,707	384,650	5,117	1,361,707	3,944,406	6,385,303
	1880	39	4,965,726	.....	4,557	846,620	3,285,917	5,256,557
Southern states	1890	486	62,623,729	2,691,426	44,768	9,771,056	32,624,416	49,729,674
	1880	613	20,413,414	.....	19,409	3,254,936	12,781,692	20,381,689
Virginia	1890	47	4,089,511	177,750	2,950	628,159	1,998,555	2,964,171
	1880	56	1,646,850	.....	1,477	241,509	1,023,471	1,618,930
North Carolina	1890	124	11,195,122	442,056	9,276	1,747,729	6,553,635	10,053,204
	1880	98	3,058,900	.....	3,528	462,854	1,719,352	2,857,642
South Carolina	1890	35	11,144,233	528,236	8,193	1,646,689	6,820,132	9,801,956
	1880	25	2,784,000	.....	2,066	382,017	1,827,755	2,919,844
Georgia	1890	71	18,084,708	746,314	11,058	2,470,438	7,998,926	12,375,724
	1880	73	6,532,390	.....	6,496	1,161,654	4,185,462	6,724,784
Florida	e1890	.....	.....	.....	.....	.....	.....	.....
	1880	1	11,000	.....	33	5,000	18,095	25,000
Alabama	1890	22	2,965,713	158,734	2,565	515,136	1,573,938	2,398,646
	1880	30	1,275,400	.....	1,508	243,035	833,072	1,291,764
Mississippi	1890	16	3,607,198	75,676	2,266	597,251	1,380,009	2,257,583
	1880	16	1,453,040	.....	940	186,314	548,795	978,098
Louisiana	1890	6	1,516,660	15,650	1,253	290,042	737,212	1,126,751
	1880	2	195,000	.....	108	12,572	72,470	80,776
West Virginia	1890	33	408,881	27,708	328	79,380	225,961	395,701
	1880	57	328,170	.....	365	51,361	290,343	413,586
Kentucky	1890	49	4,142,815	246,643	2,876	804,094	2,300,959	3,785,436
	1880	103	1,255,750	.....	1,181	231,755	1,107,523	1,689,694
Tennessee	1890	69	4,322,336	230,116	3,172	735,095	2,525,198	3,724,138
	1880	122	1,564,264	.....	1,446	228,134	976,815	1,495,441
Arkansas	1890	8	164,236	8,775	115	21,106	46,557	71,913
	1880	27	160,550	.....	154	20,565	119,277	177,430
Texas	e1890	.....	.....	.....	.....	.....	.....	.....
	1880	3	147,500	.....	107	28,166	59,262	102,100
All other southern states (e)	1890	6	982,316	33,762	716	235,937	463,334	774,392

a Value of hired property is not included in the capital reported in 1890, because it was not included in the report of 1880.

b This item was not reported at the census of 1880.

c Includes 2,115 officers and clerks engaged in cotton manufacture whose salaries were not reported.

d Maryland is classed as a middle state for purposes of comparison.

e Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Florida, 1; Texas, 5.

TABLE 2.—COMPARATIVE STATEMENT OF COMBINED TEXTILE INDUSTRIES IN THE UNITED STATES, BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1890 AND 1880—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
					Employés.	Wages.		
Western states	1890	504	$28,581,689	$1,811,829	22,451	$6,374,734	$15,674,282	$27,029,868
	1880	651	15,263,576	.....	14,284	3,171,147	11,375,888	18,305,722
Ohio	1890	125	4,820,526	314,894	3,970	1,130,518	3,233,787	5,437,483
	1880	163	2,323,340	.....	2,839	511,923	1,780,099	3,032,669
Indiana	1890	61	5,431,065	379,881	4,434	1,150,063	3,208,276	5,214,211
	1880	95	3,413,105	.....	2,784	662,310	2,587,954	4,074,576
Illinois	1890	75	4,119,495	234,455	4,072	1,315,335	2,429,564	4,666,115
	1880	85	1,825,203	.....	2,337	555,209	1,937,336	2,980,116
Michigan	1890	44	1,691,461	119,060	1,635	430,996	1,110,018	1,964,974
	1880	51	726,189	.....	1,397	185,364	624,241	928,766
Wisconsin	1890	60	4,603,613	279,328	3,884	952,933	2,399,217	4,100,201
	1880	53	1,559,964	.....	1,146	285,566	1,096,474	1,827,275
Minnesota	1890	25	815,144	70,917	475	170,703	398,300	730,458
	1880	15	203,500	.....	263	55,327	190,867	303,378
Iowa	1890	20	896,741	53,069	539	181,640	629,832	899,918
	1880	37	555,700	.....	505	118,252	437,301	682,812
Missouri(a)	1890	45	896,020	38,608	804	204,267	452,068	798,736
	1880	109	1,665,550	.....	1,350	235,107	1,105,497	1,563,641
Kansas	b1890	.....	.....	.....	.....	.....	.....	.....
	1880	6	141,425	.....	126	26,075	107,401	212,065
Utah	1890	14	612,579	29,301	344	121,176	189,339	392,094
	1880	12	402,000	.....	306	70,208	150,698	287,351
Washington	b1890	.....	.....	.....	.....	.....	.....	.....
	1880	1	40,000	.....	29	4,000	52,000	70,000
Oregon	1890	6	1,350,585	86,906	402	175,313	327,502	614,932
	1880	10	566,800	.....	216	86,088	227,486	549,030
California	1890	20	3,235,263	199,373	1,794	516,590	1,238,067	2,080,215
	1880	14	1,840,800	.....	986	375,718	1,078,534	1,794,033
All other western states(b)	1890	9	109,197	6,037	98	25,200	58,312	130,531

a Missouri is classed as a western state for the purpose of comparison.

b Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 2; Idaho, 1; Kansas, 2; Nebraska, 1; South Dakota, 2; Washington, 1.

The foregoing table brings out in strong light the concentration of the textile interests in the New England and middle states, where were produced in 1890 $645,189,720, or 89.37 per cent of the total value of textile products in the United States, being an increase of 30.61 per cent over the production of these states in 1880. The New England states alone produced 50.64 per cent of the total product of the United States, an increase of 17.73 per cent over the value of their textile products in 1880. The middle states produced 38.73 per cent of the total product, an increase of 52.40 per cent over 1880. The increase in the textile products of the states included in the southern group has been more marked than in those included in the western, due to the notable increase in cotton manufacture. The southern states produced textiles to the value of $49,729,674 in 1890, being 6.89 per cent of the total value of textiles, an increase of 143.99 per cent over the value of their production in 1880. This increase is almost entirely in the manufacture of cotton, as the product of the wool, hosiery, silk, and dyeing and finishing industries in the south reported at the census of 1890 amounted only to $8,215,963.

The product of the textile industry for the western states, as reported at the census of 1890, is but $27,029,868 or 3.74 per cent of the total product of the country, though an increase of 47.66 per cent over the value of the product of the western states in 1880. This increase was chiefly in the manufacture of woolen and hosiery and knit goods, the product of other textile industries in the western states having a total value of $8,053,696 in 1890.

The state of Massachusetts is still the leading textile manufacturing state of the Union, manufacturing in 1890 a product valued at $184,938,074, of which $100,202,882 or 54.18 per cent was the value of cotton goods. The value of Massachusetts textile products in 1890 was 25.62 per cent of the production of the entire country, the gain during the decade being 20.88 per cent.

Pennsylvania ranks second as a textile producing state, manufacturing goods to the value of $132,367,499 in 1890, which is 18.33 per cent of the total product of the country, and an increase of 49.41 per cent over her product of 1880.

The northern state which shows the largest percentage of increase in product during the decade is New Jersey, where an increase of 65.79 per cent is shown. After New Jersey, New York shows the largest percentage of increase, 53.35, followed by Pennsylvania with 49.41 and Rhode Island with 30.40 per cent.

Of the southern group, the state of Georgia ranks first in total value of product, with an increase of 84.03 per cent, followed by North Carolina with an increase of 251.80 per cent, South Carolina with an increase of 235.70 per cent, and Kentucky with an increase of 124.03 per cent. As previously stated, the great increase in this section is due principally to the development of the cotton industry during the past decade.

It is to be noted that the states in which any single branch of the textile industry is successful are those in which each of the others chiefly flourish. The development of the cotton manufacture in the south is the only conspicuous exception to this rule. The rule may be tested by observing that the limited number of states in which the silk manufacture has a large development are states in which the cotton and wool manufactures are increasingly and successfully carried on. Nevertheless the tendency to localization, which is strong in each textile industry, has resulted in making four cities in different states the chief localities in which each industry is carried on: Philadelphia, Pa., in the wool manufacture; Fall River, Mass., in the cotton manufacture; Paterson, N. J., in the silk manufacture, and Cohoes, N. Y., in the hosiery and knit goods manufacture.

Table 3 presents the percentages of increase in the combined industries, as shown by the census reports of 1880 and 1890. The more thorough method employed at the current census may have in a measure affected the increase shown in some of the items, especially that of capital.

TABLE 3.—COMPARATIVE STATEMENT AND PERCENTAGE OF INCREASE FOR TEXTILE INDUSTRIES: 1890 AND 1880.

GENERAL HEADS.	1890	1880	Percentage of increase.
Number of establishments	4,114	4,018	2.39
Capital (a)	$739,973,661	$412,721,496	79.29
Miscellaneous expenses	$43,356,736	(b)	.....
Average number of employés	511,897	c384,251	33.22
Total wages	$172,082,609	$105,050,666	63.81
Cost of materials used	$421,398,196	$302,709,894	39.21
Value of products	$721,949,262	$532,673,488	35.53

a Value of hired property is not included in the capital reported in 1890, because it was not included in the report of 1880.

b This item was not reported at the census of 1880.

c Includes 2,115 officers and clerks engaged in cotton manufacture whose salaries were not reported. Therefore, in computing the percentage of increase in wages, the amount, $3,464,734, paid these classes in the cotton industry in 1890 is not included.

In the value of their products the wool and cotton manufactures rank very closely. At the census of 1890 the value of the product of the wool manufacture is shown to be $337,768,524, and of cotton manufacture as $267,981,724, but all cotton knit goods and hosiery are included with the former, as well as cotton goods manufactured in woolen mills. If it were possible to make an exact classification of the products along the line of the predominating fiber, we should find the value of the products of these two industries about the same. Moreover, mixed textiles, so called, made of wool and cotton, are all enumerated with the wool manufacture in accordance with the rule which classifies them with the products of the fiber predominating in value. In all the following comparisons between the two industries the statistics of hosiery and knit goods manufacture are omitted from the totals of wool manufacture for the reason above given.

Up to 1870 the value of the cotton manufactures greatly exceeded that of wool manufactures, as shown by the following table:

TABLE 4.—COMPARATIVE VALUE OF TEXTILE PRODUCTS FROM 1800 TO 1890.

YEARS.	Wool.	Cotton.	Silk.
1800	.....	$170,000	.....
1810	.....	3,240,000	.....
1820	$4,413,068	25,000,000	.....
1830	14,528,166	27,000,000	.....
1840	20,696,999	46,350,453	.....
1850	48,608,779	61,869,184	$1,809,476
1860	73,454,000	115,681,774	6,607,771
1870	199,257,262	177,489,739	12,210,662
1880	238,085,686	192,090,110	41,033,045
1890	270,527,511	267,981,724	87,298,454

In the foregoing table the estimates of the special agents on the cotton and wool manufactures, for the value of product at the census years prior to 1840, are used in the absence of complete official data for those years.

The reversal of relations in the value of the products of the wool and cotton manufactures which occurred between 1860 and 1870 was the direct result of conditions created by the war, as the cotton famine, the demand for woolen goods for the army, and the large development of the domestic wool clip. In the interval since 1860 the fall in the value of wool has been much greater relatively than the fall in the value of cotton, and this factor has had a great influence in bringing the relative values of the manufactured product nearer together.

COMPARATIVE CONSUMPTION OF FIBERS.

The relative value of products is not a true measure of the consumption, which can only be judged by the quantity of raw material used in the mills. The volume of cotton products entering into popular consumption is much the greater. This is shown by the following comparative table, which gives the annual consumption in quantities of raw cotton and wool, and so far as possible for silk by decades for fifty years.

TABLE 5.—COMPARATIVE STATEMENT OF CONSUMPTION OF TEXTILE FIBERS: 1840–1890.

YEARS.	Wool.	Cotton.	Silk.
	Pounds.	*Pounds.*	*Pounds.*
1840	.....	126,000,000	.....
1850	70,862,829	288,558,000	.....
1860	95,452,159	422,704,975	462,965
1870	214,373,219	398,308,257	684,488
1880	287,597,334	750,343,981	2,690,482
1890	351,158,020	1,117,945,776	6,376,881

If to the cotton consumed in 1890, as given above, we add the 75,428,865 pounds of cotton consumed by the woolen industry, including hosiery and knitting mills, and to the wool consumed we add the 21,639,393 pounds of wool consumed in hosiery and knitting mills, we have a total of 1,193,374,641 pounds of cotton used by domestic manufactures in the census year, as compared with a total of 372,797,413 pounds of wool, or 3.20 pounds of cotton to each pound of wool. A large quantity of hair and shoddy is consumed in wool manufacture, and the quantity of wool consumed is reported "in condition purchased" with an average shrinkage of 50 per cent. while the cotton consumed shrinks but little beyond the wastage.

NUMBER OF ESTABLISHMENTS.

The smallest percentage of increase shown in Table 3 is in the number of establishments reporting. This column strikingly illustrates the tendency apparent in the textile industries toward the concentration of manufacture in large establishments. This tendency is chiefly between 1880 and 1890 in the wool manufacture, where the number of establishments reporting in 1890 is less than in 1880. The special reasons for this are fully set forth in the report on wool manufactures. The remaining branches of the textiles each show a substantial increase in the number of establishments, but the percentage of gain is much smaller in this particular than in the other items. Neither the cotton nor the silk statistics have ever been complicated by statistics of the household industry in the manner that is still true of the woolen manufacture; but a reference to Table 1 shows that the number of establishments now engaged in manufacturing cotton is smaller than in 1850–1860, although their spindle capacity is now nearly four times as great as in 1850. The number of silk mills, on the other hand, has steadily increased, except for the decade ending in 1870.

The widest contrasts are presented by the organization of the cotton and wool industries. The cotton manufacture, conducted as a rule under the corporate method, is carried on in large mills, comparatively few in number, the 905 establishments reported at 1890 manufacturing a product nearly equal in value to the product of the 1,693 wool manufacturing establishments. There are comparatively few very large mills engaged in manufacturing wool fabrics.

CAPITAL.

The figures given under the head of capital must be used with caution, as the method of reporting this item has varied with every census, and has never before resulted in a return so complete and comprehensive as that presented for 1890. With this caution, we present a table showing the capital in each of the textile industries for each decade since 1840.

TABLE 6.—CAPITAL IN THE TEXTILE INDUSTRIES FROM 1840 TO 1890.

YEARS.	Wool.	Hosiery and knit goods.	Cotton.	Silk.
1840	$15,765,124	(a)	$51,102,359	.....
1850	31,971,631	$544,735	74,500,931	$678,300
1860	38,814,422	4,035,510	98,585,269	2,926,980
1870	121,451,059	10,931,260	140,706,291	6,231,130
1880	143,512,278	15,579,591	208,280,346	19,125,300
1890 (b)	245,886,743	50,607,738	354,020,843	51,007,537

a Not separately reported.

b Value of hired property is not included in the capital reported in 1890, because it was not included in the reports of previous census years.

The relationship between capital and the value of the product varies in accordance with the character of the material used. The silk manufacture, utilizing the most costly and delicate of the fibers, produces much the largest value of product relatively with the amount of capital, and after silk the wool manufacture. The product of the latter is valued at $24,640,768 in excess of the capital utilized, while the capital in the cotton manufacture is $86,039,119 in excess of the value of the product. This general relationship between capital and product in each of the textile industries has existed since 1850, as shown by Table 1, although the given amount of capital in each industry produced a much larger product relatively in the earlier decades than at present.

RELATIONSHIP BETWEEN MATERIALS AND PRODUCT.

The relationship between the cost of materials and the value of the product exhibits a striking uniformity in all the textile industries. This is shown by the following table, which gives the cost of materials in $100 of product for 1890 in each industry:

TABLE 7.—COST OF MATERIALS USED AND VALUE OF PRODUCTS.

INDUSTRIES.	Cost of materials used.	Value of products.	Cost of materials in $100 of product.
Wool	$167,233,987	$270,527,511	$61.82
Hosiery and knit goods	35,861,585	67,241,013	53.33
Cotton	154,912,979	267,981,724	57.81
Silk	51,004,425	87,298,454	58.43

COMPARISON OF EMPLOYÉS AND WAGES.

Table 8 presents the average number of employés and amount of wages in each branch of the textile industry, together with the total wages and the average annual earnings of males, females, and children, for each class in 1890.

TABLE 8.—AVERAGE NUMBER OF EMPLOYÉS, TOTAL WAGES, AND AVERAGE ANNUAL EARNINGS FOR THE UNITED STATES: 1890.

INDUSTRIES	AGGREGATES.			OFFICERS, FIRM MEMBERS, AND CLERKS.					
				Males above 16 years.			Females above 15 years.		
	Average number.	Total wages.	Average annual earnings per employé.	Average number.	Total wages.	Average annual earnings per employé.	Average number.	Total wages.	Average annual earnings per employé.
Combined textiles	511,897	$175,547,343	$342.93	9,709	$11,724,072	$1,207.55	470	$206,678	$439.74
Wool	157,923	58,397,470	369.78	3,530	4,011,337	1,136.36	122	46,358	379.98
Hosiery and knit goods	61,239	18,263,272	298.38	1,520	1,641,230	1,079.76	101	43,923	434.88
Cotton	221,585	69,489,272	313.60	2,627	3,427,362	1,304.67	82	37,372	455.76
Silk	50,913	19,680,318	386.55	1,396	1,852,235	1,326.82	135	65,642	486.24
Dyeing and finishing	20,267	9,717,011	479.45	636	791,908	1,245.14	30	13,383	446.10

INDUSTRIES.	ALL OTHER EMPLOYÉS.								
	Males above 16 years.			Females above 15 years.			Children.		
	Average number.	Total wages.	Average annual earnings per employé.	Average number.	Total wages.	Average annual earnings per employé.	Average number.	Total wages.	Average annual earnings per employé.
Combined textiles	216,345	$91,038,323	$420.80	243,589	$66,644,785	$273.60	41,784	$5,933,485	$142.00
Wool	78,550	33,702,231	429.05	64,944	18,883,174	290.76	10,777	1,754,370	162.79
Hosiery and knit goods	14,846	6,041,200	406.92	40,826	10,006,070	245.09	3,916	530,849	135.56
Cotton	88,837	33,797,517	380.44	106,607	29,165,080	273.58	23,432	3,061,935	130.67
Silk	17,602	9,349,531	531.16	28,914	7,970,065	275.65	2,866	442,845	154.52
Dyeing and finishing	16,510	8,147,844	493.51	2,298	620,390	269.97	793	143,486	180.94

The amount paid in wages to all classes of employés in the combined textile industries has increased 63.81 per cent since 1880. In making this calculation the amount paid officers and clerks in cotton mills is not included in the total amount of wages for 1890, as it was not reported at the census of 1880. The largest increase occurred in the hosiery and knit goods industry where it was shown to be 172.53 per cent. Silk follows, with an increase of 115.16 per cent; then cotton, with an increase of 57.05 per cent; dyeing and finishing, with an increase of 50.08 per cent, and finally wool, with an increase of 43.53 per cent. The increase in wages and average annual earnings for each employé, as in other items, may be due in part to the change in the form of inquiry and the more perfect enumeration at the census of 1890. The large decrease in the number of children employed also has considerable bearing on the increase in the average annual earnings.

The average annual earnings for all classes of employés differ widely in the several industries. For the division of the average annual earnings between men, women, and children, and the manner in which the average is affected by the relative number of each class and the time employed, reference is made to the tables presenting the data in detail for wool, cotton, and silk manufacture.

The cotton manufacture employs the largest number of operatives, but the wool manufacture employs the largest proportion of men. The following table shows the number of men, women, and children, and their relative proportion in each industry for 1880 and 1890:

TABLE 9.—AVERAGE NUMBER OF MALES, FEMALES, AND CHILDREN IN EACH INDUSTRY, WITH THE PERCENTAGE THAT EACH IS OF THE TOTAL NUMBER OF EMPLOYÉS: 1880 AND 1890.

INDUSTRIES.	MALES ABOVE 16 YEARS.				FEMALES ABOVE 15 YEARS.				CHILDREN.			
	1880		1890		1880		1890		1880		1890	
	Average number.	Percentage.	Average number.	Percentage.	Average number.	Percentage.	Average number.	Percentage.	Average number.	Percentage.	Average number.	Percentage.
Combined textiles	159,382	41.48	226,054	44.16	169,806	44.19	244,059	47.68	55,063	14.33	41,784	8.16
Wool	67,942	51.21	82,089	51.98	49,107	37.01	65,066	41.20	15,623	11.78	10,777	6.82
Hosiery and knit goods	7,517	26.02	16,366	26.74	17,707	61.30	40,927	66.86	3,661	12.68	3,916	6.40
Cotton	61,760	35.36	91,464	41.28	84,558	48.41	106,689	48.15	28,341	16.23	23,432	10.57
Silk	9,375	29.92	18,998	37.31	16,396	52.32	29,049	57.06	5,566	17.76	2,866	5.63
Dyeing and finishing textiles	12,788	76.58	17,146	84.60	2,038	12.21	2,328	11.49	1,872	11.21	793	3.91

It is evident from the tables here presented that the textile industries have flourished in keeping with the general prosperity of the country. The natural aptitude of our people fits them for equal success in any of these industries, and climatic conditions are, on the whole, as favorable here as elsewhere. In every branch of textiles our national contributions to the development and perfecting of the special machinery employed in the manufacture have been of the utmost importance.

The manufacture of linen has never been largely carried on in the United States, although we have several large mills which have been successfully operated for many years. This is explained by the inferior character of our domestic flax as compared with that of Belgium and Ireland, by the excessive amount of care and labor required in the preparation of the fiber for spinning, and by the comparatively limited market for linen goods, which diminishes the inducement to enter into competition with countries where the manufacture of these goods has been made a specialty for generations, and in which it has reached a high degree of excellence.

Contrasting the general conditions of the textile industries of this country with its conditions elsewhere, one is impressed with the great diversification which attends it here and with the remarkable manner in which it adapts its products to the daily needs of our own people. Manufacturing almost wholly for domestic consumption, the aim in all lines has been to anticipate and meet the average wants of the home community. This tendency has resulted in the development of the manufacture of the cheaper and coarser fabrics of all fibers, and a comparatively small advance in the higher and more expensive products. There are notable exceptions to this rule in every branch, particularly carpets; and the one characteristic of the progress of the last decade, which distinguishes it beyond the limits of statistical comparison from the progress of any previous decade, has been the advance made into the higher forms of the textile arts. This advance has occurred in all branches, and is dwelt upon in detail in the special reports which follow.

WOOL MANUFACTURE.

BY S. N. D. NORTH.

The Eleventh Census completes the statistical record of the first century of woolen manufacture in the United States by the factory system, as now understood and developed. The statistical history of the industry for the first half of the century is meager and desultory. For the fifty years last past, it has been presented by the several censuses with a detail which makes it possible to accompany the present report with a comparative summary of all the statistical data regarding American wool manufacture and the hosiery and knit goods manufacture which have appeared in the federal censuses since 1840. The data presented in census records prior to 1840 are so fragmentary that it is impossible to reduce them to tabular form in harmony with the later statistics. The preparation of the tables for the fifty years they cover has been accompanied by many difficulties, owing to the different methods of grouping adopted and the conflicting character of the figures that are published. To illustrate these difficulties, it may be stated that at times the hosiery and knit goods manufacture has been counted as a part of the wool manufacture, and at other times it has been separately enumerated, and not subsequently incorporated. Carding mills are partially included in the census of 1870 and subsequently, but not always prior to that date. The utmost pains have been taken in constructing these tables to bring together all the figures that properly belong in them. The figures for woolen goods, worsted goods, carpets, felts, wool hats, and hosiery and knit goods are combined, whenever obtainable. Where deficiencies exist which can not be supplied attention is called to them in the footnotes attached.

The chief difficulty in the compilation of the scattered returns contained in previous censuses has arisen from the failure to include the statistics of hosiery and knit goods manufacture. The increasing use of cotton in this industry furnishes a reason why it should be separately treated, as in this table; but the total wool consumption can only be correctly stated by including these statistics with those of the other branches of the industry. While the quantity of cotton consumed in this industry now vastly exceeds that of wool, yet the value of the wool remains the greatest, justifying the classification of the census. In all the references of this report, therefore, the statistics of hosiery and knit goods are included.

The confusion that has existed, in consequence of the failure of previous census reports to properly group all these figures, has led to many errors in attempts to measure the statistical growth of the American wool manufacture on the basis of census figures, errors due to the omission, in one year or another, of one or another of the separate groups of figures essential to a complete comparison.

The rate of progress for the decade covered by the Eleventh Census has not been as rapid as that which marked several of the previous decades covered by Tables 1 and 2, but it has been healthy and steady, as is shown by the following comparative table:

GENERAL HEADS.	1890	1880	Percentage of increase.
Number of establishments	*a*2,489	2,689	*b*7.44
Capital	*a*$296,494,481	$159,091,869	*c*86.37
Miscellaneous expenses	$19,249,508	(*d*)	.....
Average number of employés	219,132	161,557	35.64
Total wages	$76,660,742	$47,389,087	61.77
Cost of materials used	$203,095,572	$164,371,551	23.56
Value of products	$337,768,524	$267,252,913	26.39

a Not including 267 idle establishments reporting invested capital amounting to $6,100,860. Does not include the value of "Hired property."

b Decrease.

c The great increase shown in the amount of capital employed as between 1890 and 1880 is more apparent than real, and is largely due to the fact that the capital returned for the census of 1880 did not take cognizance of all items which properly go to make up "live assets", and which, it is believed, are for the first time fully included in the census of 1890.

d This item was not reported at the census of 1880.

In this comparison we must bear in mind the fact that the year 1879–1880, in which the prior census was taken, was a year of unusual and at times even speculative activity in the wool manufacture, and it is commercially

recognized as the most prosperous year the industry has encountered since the war. On the other hand, the year 1889–1890 was a comparatively dull year in the wool manufacture, in which a considerable portion of the machinery of active mills was idle during a part or the whole of the year.

Another fact to be considered in making the comparison is the large reduction in the market value of the goods covered by this report. Probably no previous decade witnessed so general a downward movement in prices. The value of products now given indicates a much greater quantity of production than the same value in 1880 or in any previous year would have signified. Something of the measure of this decline in value of products is indicated by the fall in the cost of raw materials. The whole subject is discussed in another portion of this report.

No statement relating to mixed textiles will be made in the reports of the Eleventh Census similar to that embodied in Table VII, page 465, volume 2, of the Census of 1880. To avoid a possible misapprehension, it is necessary to state that a careful examination of the original data from which these statistics of "mixed textiles" were compiled for the Tenth Census, shows that so far as these products consisted of goods composed of wool and cotton, with wool the component material of chief value, they were a duplication of products already reported and accounted for in the statistics of the wool manufacture proper. For this reason no cognizance is to be taken of the products reported as "mixed textiles" in a comparison of the statistics of wool manufacture of the two census periods.

CONNECTICUT.

The reported value of the products of the wool manufacture of the state of Connecticut, as shown in Tables 1 and 2, is less by $4,011,764 than that reported in 1880, notwithstanding an increase in the machinery capacity of the state. The suspicion of inaccuracy excited by this fact led the special agent to make a careful comparison of his returns with those received by the Connecticut state bureau of statistics of labor. The comparison showed that the returns from the mills reporting to the state bureau were substantially the same as those made to the Census Office, thus confirming in a striking manner the accuracy of both. The decrease is partly due to the substitution of fur for wool in the hat manufacture, thus excluding the statistics of several mills from this report; but it also extends to the manufacture of woolen and worsted goods. An examination of individual returns made in 1880 leads the special agent to believe that the value of the products of Connecticut was exaggerated ten years ago.

MANUFACTURING IN PUBLIC INSTITUTIONS.

Various branches of the wool manufacture are carried on in the public, penal, and eleemosynary institutions of 9 states, all data of which are omitted from these tables. This manufacture consumed 76,300 pounds of wool and 210,000 pounds of cotton; but most of its products were made from purchased yarns, and consisted of hosiery and other knitted goods to the value of $403,137. The remaining products were chiefly flannels, linseys, and cotton-warp cloths. The other details regarding this phase of the manufacture are contained in the following table:

WOOL MANUFACTURE—STATEMENT OF PUBLIC, PENAL, AND ELEEMOSYNARY INSTITUTIONS.

STATE.	Number of institutions.	Employés.	Total wages.	Cost of materials used.	Value of products.
Total	14	1,419	$88,279	$279,800	$462,585
New York (a)	3	604	24,697	53,708	97,995
Pennsylvania (b)	3	432	36,060	132,181	196,306
All other states (c)	8	383	27,522	93,911	168,284

a Institutions in New York: hosiery and knit goods, 3.

b Institutions in Pennsylvania: hosiery and knit goods, 1; carpets, 2.

c Includes states having less than 3 institutions, so that the operations of individual institutions may not be disclosed. These institutions are located as follows: Maryland, 1, hosiery and knit goods; Minnesota, 1, hosiery and knit goods; New Hampshire, 1, hosiery and knit goods; Ohio 2, hosiery and knit goods; Texas, 1, woolen goods; Virginia, 1, hosiery and knit goods; Wisconsin, 1, hosiery and knit goods.

METHODS OF THE PRESENT INVESTIGATION.

In the preparation of the schedules for this inquiry pains were taken to avoid, so far as possible, any modifications that would prevent accurate comparisons with the statistics collected in 1880. The schedule of the last census was prepared by the late George William Bond, of Boston, and the data collected were compiled under his direction. Mr. Bond was recognized as the leading expert in the United States on all questions connected with wool and its manufacture. He had annually compiled since 1865 a review of the wool markets of the country, for the Boston Board of Trade, and his annual wool circulars contained the accepted data regarding the volume and movement of the clip. He was familiar also with the manufacture, and his schedule, the first special census schedule prepared for this industry, was based upon an intimate knowledge of the conditions of the industry, and of the information likely to be of service in connection with a statistical exhibit of its condition and progress. The present special agent accepted Mr. Bond's schedule after correspondence with manufacturers, except in two particulars. It was evident that the inquiry of 1880 had not resulted in a satisfactory return of the

capital invested, and for Mr. Bond's questions, under this head, were substituted those adopted by the Census Office for uniform use upon all the special schedules relating to manufactures. In the classification of products a new system was also adopted. In these two particulars no comparison of returns as between 1880 and 1890 can be safely attempted. In other respects it is believed that the comparison is exact and accurate. At the same time the statistics of the manufacture are now presented with a detail and closeness of analysis exceeding anything attempted in 1880. This is particularly the case in the wage tables and in the assignment of values to the different varieties of manufactured products.

NUMBER OF ESTABLISHMENTS.

The total number of establishments for which returns were received at the Eleventh Census was 2,770, of which number 267 were not in operation during the census year, and 14 were conducted by public, penal, and eleemosynary institutions. The number of establishments reported in 1880 was 2,689.

The number of establishments affords no clew to the growth or condition of the industry of wool manufacturing. This is due to the fact that in all censuses of the industry (except that of 1860) the custom carding mill has been counted as a woolen factory, although it is not, in the modern use of the term, a factory, and it ought therefore to be excluded from the statistics of factory manufacture. The present census has made such an elimination possible hereafter by a separate return of the statistics of custom carding mills.

CUSTOM CARDING MILLS.

These mills are simply neighborhood industries, similar in character to grist mills or the ginning mills of the cotton districts, that prepare the locality wool for the household spinner and weaver. Formerly they were scattered in great numbers all over the country, and were frequently combined with fulling mills, which finished the home-spun cloth for domestic use. Nearly every New England township had its carding and fulling mill, with machinery generally moved by water power. The trade of the clothier and fuller was as distinct as that of the hatter, and both have nearly disappeared. In Vermont, in 1810, 1,040,000 yards of cloths and flannels were woven in private families and dressed in these mills. In 1840 the census reported the existence of 2,585 fulling mills, which included the woolen mills (*a*), and it is probable that even at that late date the value of the woolen goods made in the household, with the assistance of these auxiliary mills, exceeded the value of the factory product. In 1850 the wool-carding establishments, exclusive of regular woolen factories, were returned as 630 in number, consuming wool to the value of $1,251,550 and manufacturing a product valued at $1,739,476. In 1860, when the census was more closely taken, the number of carding mills reported was 712, using 5,230,651 pounds of wool, of a value of $1,759,125, which were converted into rolls valued at $2,403,513. The geographical location of these mills show how strictly they were the pioneers of an advancing civilization. They had then almost disappeared from the New England states, but 64 being reported there, as compared with 99 in the middle states, 217 in the southern states, and 328 in the western states, with four establishments only in the Pacific states. The average value of the wool carded was 33½ cents a pound.

No data appear in the census reports of 1870 to show the number of carding mills included in the returns for that year. The census of 1880 had returns for 570 carding mills, which it did not separately report, and from 233 other mills, each of which used less than 5,000 pounds of wool per annum.

With the growth of the factory manufacture these custom carding mills are disappearing with accelerating rapidity, and there are now left in the United States but 193 distinct carding mills of which the special agent could obtain trace. These are very irregularly located, as shown in Table 15, where a distinct statement is made for them, although they are included as woolen mills in all preceding tables.

These 193 carding mills employed but 416 persons, all told, to whom were paid $61,618 in wages; they consumed but 874,253 pounds of scoured wool, which was chiefly converted into rolls for household use, and was worth $476,278 in that form. The very low average earnings indicated by the above figures was due primarily to the fact that most of these mills were in operation for portions of the census year only. Such wage statistics obviously have no proper place in the general statistics of the wool manufacture.

There were in addition a number of returns received upon the general manufacturing schedule from mills which ran a carding engine for a few months in the year in connection with the grist mill or sawmill, which comprised the chief business of the establishment. No effort was made to include any portion of these returns in the statistics of wool manufacture herewith presented, and the actual consumption of wool in carding mills is therefore in excess of the quantity stated.

The census of 1860 showed the employment of 1,276 persons in carding mills whose earnings aggregated $286,267, a much larger annual average than that shown in the statistics for 1890. This difference in the earnings as between the two periods is the most striking evidence of the decadence of the custom carding mills as a feature in the industrial condition of the country. While earnings in every other branch of wool manufacturing have greatly advanced they have here greatly fallen off.

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a See Census of Manufacturers, 1860, p. xlviii.

It was exceedingly difficult to obtain satisfactory returns for these carding mills. In a majority of cases the proprietors reported that they did their own work, often with the assistance of members of their own families, to whom they paid no wages. In many cases, also, they declined to put a value upon their product, for the reason that they carded the wool of their customers into rolls, never owning the wool themselves, but charging so much per pound for their labor. In other instances they received their pay in produce. The wool thus carded entered almost invariably into household manufacture, which still exists to a considerable extent, particularly in the states of Maine, Pennsylvania, Kentucky, Tennessee, Missouri, Wisconsin, and Minnesota.

The inclusion of these small carding mills in the number of establishments reporting has deprived that column of any value as a test of growth. Thus the total number of establishments reporting in the several censuses, was as follows:

1840	1,420	1870	3,456
1850	1,760	1880	2,689
1860	a1,673	1890	2,770

The number of actual mills in existence in 1890 was much larger than at any previous census, if these local industries are excluded.

It must also be considered that the "number of establishments" does not exactly represent the number of mills, for the reason that two and sometimes three mills, formerly reported separately, are frequently consolidated and operated under one management, from which but a single report is received.

SIZE OF WOOLEN MILLS.

The tendency of the industry is in the direction of larger mills. The majority of the establishments in the earlier days of the industry were one and two set mills, and this continues to be the case in the southern and western states. But in the eastern states the larger mills now greatly predominate, as is shown by the following table, which groups the woolen mills of the several geographical divisions according to their machinery capacity:

NUMBER OF MILLS OF EACH CLASS.

GEOGRAPHICAL DIVISIONS.	Total.	1 set.	2 set.	3 set.	4 set.	5 set.	6 set.	7 set.	8 set.	9 set.	10 to 15 set.	15 to 20 set.	20 set and over.	Carding mills.
Total	1,656	364	246	157	133	79	100	55	66	29	127	47	60	193
New England states:														
Woolen mills	504	47	49	44	53	34	39	26	33	16	72	26	37	28
Hosiery and knitting mills	59	8	9	7	6	5	6	5	5	1	6	.....	1	.....
Middle states:														
Woolen mills	466	120	78	53	34	22	34	6	17	6	25	17	18	36
Hosiery and knitting mills	108	3	11	15	16	7	13	14	3	6	15	3	2	.....
Southern states:														
Woolen mills	197	57	38	10	8	2	.....	.....	1	.....	5	.....	1	75
Hosiery and knitting mills	2	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Western and Pacific states:														
Woolen mills	301	123	56	24	12	8	7	4	7	.....	4	1	1	54
Hosiery and knitting mills	19	6	4	4	4	1	.....	.....	.....	.....	.....	.....	.....	.....

GEOGRAPHICAL LOCATION OF THE INDUSTRY.

The American wool manufacture, during the period in which the household branch of it predominated, was scattered over wide sections of the country and into remote and inaccessible districts. This was naturally the case at a time when so large a proportion of the population literally made their own clothing, from the growing of the raw material to the weaving of the goods. Two causes tended to make the custom carding mill the genesis of the modern factory, and the wool manufacture of to-day is an evolution from the household industry to a degree and in a sense unknown in any other textile manufacture. These causes were the necessity of locating upon a stream for water power and the advantage of being near the supply of the raw material. The custom carding mill found its patronage in districts where the flocks abounded. As it developed into the primitive woolen factory, it was still a great advantage to be near the sheep, for transportation was difficult and costly. In the case of the early mill at Oriskany (New York), a large flock of merino sheep imported, owned, and cared for by the mill owners, was one of the adjuncts of the manufacture. As the flocks spread in the new states, the mills were planted in their midst, and not clustered in a few centers, as in Europe.

a Exclusive of carding mills.

This diffusion of the industry over wide areas is brought out strongly in the earlier censuses, and its modern tendency to gradual concentration is a most important deduction to be drawn from the present census. Ohio, in 1870, then our largest wool-growing state, reported 230 woolen mills, with 334 sets of machinery, distributed throughout the state. In 1890 the number of mills in Ohio had fallen to 113 and their machinery capacity to 112 sets. These Ohio mills were brought into existence by the proximity of the raw material, and they formerly used only the wool grown in their immediate neighborhood. What was true of Ohio was true also of Illinois, Indiana, Iowa, Michigan, Wisconsin, Missouri, and other western states which were prominent thirty and forty years ago as producers of the raw material of this manufacture.

It is a peculiarity of the wool industry here and everywhere that its original characteristics were largely determined by the quality of the domestic wool supply. Thus, Turkey, growing nothing but carpet wools, has manufactured few cloths, but her rugs and Smyrna carpets have found their way to all the markets of the world; England, where the long combing wool sheep was early developed, invented the countless dress fabrics for common consumption made from this fiber, and England's historic supremacy in the wool manufacture is due primarily to the superiority of her domestic wool clip; Germany, having produced the electoral fine wooled sheep, brought the manufacture of light and fine broadcloths to a perfection which was for a long period unrivaled elsewhere; France established her reputation for the finest all-wool goods, such as cashmeres, serges, and countless novelties of like character, as the result of her success in breeding the merino combing wools. So the United States, where originally the domestic wool supply consisted chiefly of the fleece of the Spanish merino, confined her manufacture for years chiefly to the strong, staple, plain fabrics for which this material is so well adapted.

The following table illustrates statistically the gradual geographical evolution of the industry and its modern tendency to localization. It shows the percentage of the total wool carding machinery of the country located in each of the chief manufacturing states at the several census periods since 1870:

WOOL CARDING MACHINERY, BY STATES, 1890, 1880, AND 1870.

STATES.	1890		1880		1870	
	Number of cards (sets).	Per cent of total.	Number of cards (sets).	Per cent of total.	Number of cards (sets).	Per cent of total.
Total	8,198	100.00	7,581	100.00	9,224	100.00
Massachusetts	1,837	22.41	1,660	21.90	1,512	16.39
Pennsylvania	1,299	15.84	1,155	15.24	1,468	15.92
New York	1,403	17.11	1,150	15.17	1,170	12.69
Rhode Island	572	6.98	495	6.53	490	5.31
Connecticut	646	7.88	622	8.20	752	8.15
New Hampshire	492	6.00	385	5.08	418	4.53
Maine	387	4.72	274	3.61	335	3.63
New Jersey	235	2.87	184	2.43	111	1.20
Vermont	157	1.91	167	2.20	200	2.17
Ohio	112	1.37	182	2.40	334	3.62
Indiana	153	1.87	160	2.11	346	3.75
Illinois	71	0.87	109	1.44	251	2.72
In above twelve states	7,364	89.83	6,543	86.31	7,387	80.08
All other states	834	10.17	1,038	13.69	1,837	19.92

If this table could be carried back of 1870 it would demonstrate even more strikingly the tendency to concentration exhibited during the last twenty years. In the woolen manufacture the New England states possessed in 1870, 40.18 per cent of our machinery capacity; in 1880, 47.52 per cent, and, in 1890, 49.90 per cent. Three middle states, Pennsylvania, New York, and New Jersey, possessed in 1870, 29.81 per cent; in 1880, 32.84 per cent, and in 1890, 35.82 per cent. All the remaining states in the union, which contained 30.01 per cent of our woolen machinery in 1870, contained but 19.64 per cent in 1880, and but 14.28 per cent in 1890. The eight leading states, as shown above, contained 67.82 per cent of this machinery in 1870 and 83.81 per cent in 1890. The enormous growth for the three census periods has thus been confined to these eight states, while in the remaining states there has been an actual loss of 55.29 per cent in machinery capacity.

To properly estimate the momentum of this gravitation, the worsted industry must be included, and this branch of the manufacture is confined almost wholly to the eight states above mentioned, as shown by the following table:

STATES.	1890		1880		1870	
	Number of combs.	Per cent of total.	Number of combs.	Per cent of total.	Number of combs.	Per cent of total.
Total	855	100.00	518	100.00	261	100.00
Massachusetts	265	30.99	190	36.68	172	65.90
Pennsylvania	191	22.34	124	23.94	29	11.11
New York	88	10.29	80	15.44	1	0.38
Rhode Island	195	22.81	70	13.51	7	2.68
Connecticut	34	3.98	21	4.06	34	13.03
New Hampshire	29	3.39	21	4.05	12	4.60
Maine	5	0.59	.....	.....	.....	.....
New Jersey	29	3.39	9	1.74	6	2.30
In above eight states	836	97.78	515	99.42	261	100.00
All other states	19	2.22	3	0.58	.....	.....

These eight states therefore may be regarded as the future seat of the woolen and worsted manufacture of the United States. They are the same states in which the cotton, silk, and allied industries predominate.

This tendency may be illustrated in another way. The three cities of Philadelphia, Lawrence, and Lowell consumed, in 1890, 83,587,642 pounds of wool, as follows:

	POUNDS.
Total	83,587,642
Philadelphia, Pennsylvania	52,739,329
Lawrence, Massachusetts	13,943,944
Lowell, Massachusetts	16,904,369

The wool consumption of these three cities was in excess of the amount of wool consumed in all the states of the Union combined, with the exception only of the six states of Massachusetts, Pennsylvania, Rhode Island, Connecticut, New York, and New Hampshire. These six states, with the addition of Maine and New Jersey, consumed in their manufactures 327,050,412 pounds of wool, while all the remaining states in the Union consumed but 45,747,001 pounds.

RANK OF THE STATES IN WOOL MANUFACTURE.

From the beginning of the century until 1880 the state of Massachusetts held undisputed supremacy as the chief wool manufacturing state of the Union. The status of the industry in Massachusetts, as shown by the state census, has been as follows in the years named:

CLASSIFICATION.	1845	1855	1865	1875	1885
Number of establishments	178	146	266	242	189
Capital	$5,604,002	$7,305,500	$9,477,276	$15,800,437	$29,995,666
Value of stock used	.....	.....	$22,746,593	$21,471,327	$19,422,953
Persons employed	7,372	10,090	18,965	19,193	18,970
Wages paid	.....	.....	.....	$5,542,015	$5,688,981
Value of goods made	$8,877,478	$12,105,512	$31,550,081	$36,469,626	$31,748,278

In 1880 the value of the products of Massachusetts woolen mills was surpassed by the value of Pennsylvania products, although Massachusetts continued to lead Pennsylvania in the amount of capital invested in the industry, and in the quantity of wool consumed, while Pennsylvania exceeded Massachusetts in the number of employés and in the amount of wages paid. The value of Massachusetts products in 1890 was $72,681,408, and the value of Pennsylvania products $89,337,419. In the manufacture of woolen and worsted goods proper Massachusetts may still claim the first rank, basing that claim upon the fact that her mills consumed in that year 99,569,455 pounds of wool, as compared with 70,041,261 pounds consumed in Pennsylvania. Except in the matter of capital invested, Pennsylvania now stands at the head of the list in all other particulars.

The state of New York retains the third rank among the states, due in 1890 as in 1880 to the great production of hosiery and knit goods, which comprised $24,776,582, in a total production valued at $53,340,151.

Connecticut and Rhode Island have changed places during the decade, the former state falling from the fourth to the fifth position, and the latter advancing from fifth to fourth. The actual decrease in the value of the products of the state of Connecticut has been commented upon elsewhere; but apart from this apparent decrease in Connecticut, the advance in Rhode Island has been phenomenal, the percentage of increase amounting to 60.57 per cent.

New Hampshire occupies the sixth rank among the states, which was also hers in 1880. New Jersey passes from the eighth to the seventh position, changing places with Maine. Ohio holds the ninth rank, closely pressed by Indiana and Vermont, and the twelfth state is Wisconsin, which has outstripped half a dozen states which were her superiors at the census of 1880.

Among the cities, Philadelphia now, as heretofore, occupies the first rank in the manufacture of woolen and worsted goods. The rank of the different cities in wool manufacturing, as determined by the value of their products in 1880 and 1890, was as follows:

CITIES.	RANK.		Value of products, 1890.
	1880	1890	
Total			$121,433,937
Philadelphia, Pennsylvania	1	1	73,713,856
Lawrence, Massachusetts	2	3	10,431,192
Providence, Rhode Island	3	2	18,237,531
Lowell, Massachusetts	4	4	7,037,174
New York, New York	5	5	4,377,337
Manchester, New Hampshire	6	6	2,963,550
Camden, New Jersey	(a)	7	2,507,031
Chester, Pennsylvania	(a)	8	2,166,266

a Not reported separately in 1880.

These eight cities manufactured in 1890 35.95 per cent of the total product of the industry.

The drifting of the manufacture into this comparatively limited area, and its consequent disappearance in other sections, is in no sense a sign of decadence, but is the evidence of the gradual response of this industry to the new conditions to which the development of the factory system has given rise in other industries. The wool manufacture, being in a sense the pioneer of all the textile industries, and more extensively pursued as a household art than any other which has yielded to the methods of the factory system, has in the nature of things been the last to resist the full application of those methods. It still retains characteristics of the household industry which have never been found at all either in the cotton or the silk manufacture as they are conducted in the United States.

Home-grown wool, as a rule, now seeks certain general markets, to be thence distributed to the mills contiguous to them. The distribution of the products, no longer made as formerly through local agencies, is now effected by a highly organized system of commission houses and selling agencies, most advantageously located in the large mercantile centers. Other advantages arising from this concentration increase in importance as the industry becomes more highly organized. One of them is the advantage in the labor market. The skilled operatives required in the wool manufacture are more easily obtained in the localities where there is the most work to be found. Hence practical men say that the best place to plant a new woolen mill is by the side of those which have been long established; and hence the towns and localities in the New England and middle states, which have become, either through accident or by reason of superior water, or water power, the centers of this industry, are likely to retain it and to show its largest future development. The possession of exceptional water power privileges made Lawrence and Lowell natural textile centers, and the water power of the Blackstone river was the original reason why Rhode Island is now so thickly studded with woolen and cotton mills. It will generally be found that superior water power is present at any point where the textile industries show a tendency to localize, although Philadelphia offers a marked exception to this rule, an exception explainable on the ground that the water of the Schuylkill river is especially fitted for the processes of the wool manufacture, while the development of steam has rendered water power less essential to successful manufacture than in the early days of the industry.

Some effort has been made to attribute the localization of the wool manufacture to climatic conditions. Mr. Henry Mitchell, a Bradford (England) manufacturer, testified before a Royal Commission in 1885 that the matter of climate has much to do with the successful wool manufacture, particularly of worsted yarns, and on this point he said:

> I do not think the Americans will ever be able to make yarns so good as we can in this country. The climate of the United States is very unfavorable for the spinning of worsted yarns. The very great changes that take place, the intense heat in summer and the intense cold in winter, are very unfavorable to the spinning of our yarns. A moist climate is more suitable for them. This does not apply to the same extent to Germany. I think it likely that Germany in time will be able to supply their own manufacturers with those yarns.

While there is much truth in what Mr. Mitchell says about the influence of a moist atmosphere in spinning worsted yarns, it is also true that modern mechanical devices for moistening the atmosphere and regulating the temperature of spinning rooms have rendered the question of outside temperature and humidity one of little importance.

SPECIALIZATION OF THE INDUSTRY.

Another advantage growing out of the concentration of the industry is due to the differentiation or subdivision of the manufacture, which has long marked it in Great Britain, and is gradually finding its way into the conduct of the industry in the United States. All the processes of manufacture were uniformly conducted under one roof in the primitive woolen mill of America, a method of manufacture necessitated by its widely scattered location. To-day it is common to find mills devoted exclusively to the manufacture of yarns for sale. Other mills, while making some portion of their own yarns, weave largely in excess of their yarn production, and still other mills simply dye and finish the goods sent them by weaving establishments.

This specialization has already produced results, as applied in this country, similar to those which M. Alcan attributed to it in France: "it facilitates the labor, concentrates the aptitudes, regulates the production, and contributes to ameliorate the results and the economic conditions. Specialization renders the industry accessible to all, to moderate fortunes as well as large capital". By reason of the separate establishment of yarn mills, equipped to supply on quick notice all counts and varieties of worsted yarns, many woolen mills were enabled to turn their product at once into worsteds in response to a sudden change in popular taste without the necessity of radically altering their machinery equipment.

As this tendency to specialization becomes more marked in this country, and the conditions surrounding the manufacture approximate more closely those existing in England and on the continent, we may expect the industry to become more diffused, with an increase in the number of establishments of small capital, by reason of the smaller investment required for machinery.

The rapidity with which this specialization has advanced during the last decade is shown by the statistics of yarns made for sale. The quantity of worsted yarns so made in 1880 was 13,022,219 pounds, and in 1890 it had risen to 29,376,182 pounds. There was a smaller increase in the quantity of woolen yarn made for sale, the quantity in 1880 being 28,581,950 pounds, and in 1890 35,415,360 pounds.

It is this differentiation of the manufacture which has made Philadelphia the chief textile center of the United States, producing in the census year, 1890, 21.82 per cent of the entire wool manufacture of the country, and fast placing the manufacture there upon a footing like that which prevails in Bradford, England, where the scouring of the wool is done by one establishment, the carding and combing by another, the spinning by another, the weaving by another, the dyeing and finishing by still others, while the packing of the goods for the market often constitutes still another distinct subdivision of the business. This minute subdivision of the industry is largely the outgrowth of conditions rather than a tendency evolved from experience; but it may be said to be definitely determined that the best results are attained by it. Under this system a community like Bradford is a great beehive of interdependent industries, the separate stages of the manufacture being carried on in separate establishments. The whole energy of the management in each branch is devoted to securing the best results in that particular branch under the most economical conditions.

PECULIAR DIFFICULTIES AND VICISSITUDES OF THE INDUSTRY.

It is the commonly accepted belief, for which there is ample explanation, that the wool manufacture is the most hazardous and precarious of all lines of manufacture. Chief among the reasons for this is its dependence upon the changes of fashion. In the cotton manufacture the whole product of a mill will frequently consist of a single fabric. Samuel Batchelder, in his "Notes on the Introduction of the Cotton Manufacture" (1863), states that "thousands of looms are employed making drillings of precisely the same description, with the same number of threads both in the warp and filling, of the same average weight, with yarn of the same fineness, and without the least variation in any particular, as were first invented and made by me in 1827". In the modern wool manufacture the requirements of fashion demand new patterns every season. A large fancy cassimere mill will produce 200 to 1,000 distinct designs each season, adding greatly to the cost of manufacture. In some mills there are made not less than 50 distinct varieties or classes of fabrics, exclusive of styles. Success in the manufacture may therefore be said to depend upon a capacity to understand the popular taste, to anticipate its demands, often capricious and incomprehensible, and to adapt the product of the mill to the requirements of the market. It frequently happens that the entire output of a season will be thrown back upon the manufacturer because of some failure of pattern or coloring to conform to the popular whim. Such a catastrophe will in many cases bring ruin, where a prosperous season might have been predicated upon the experience of the season previous. The liability of the American manufacturer to calamities of this description is increased by the habit which prevails in the United States of determining the fashions in garments by standards which are set abroad.

Again, the woolen manufacturer deals with an expensive and peculiar raw material. No degree of skill in the selection of the raw material of other fabrics is equal to that required in buying and applying wool. Its preparation is also more difficult, and the finish of its products is much more complicated. The manufacturer suffers constant loss in consequence of minor defects in fabrication. An entire cut of cloth will be thrown back upon him in consequence of mispicks, threads out, or other defects, due to careless weaving. The perils of the

dyeing and finishing rooms are even greater. The dyeing of wool fabrics requires what is a distinct art by itself in Europe; and in some branches, such as the indigo fermenting vat, is the most difficult work in practical chemistry. Some slight miscalculation in the combination of dyes or acids will weaken or depreciate the fabric and throw it into "seconds".

Some branches of the wool manufacture, like carpets, require the most complete knowledge of the principles of decorative art; others, like that of printing stuffs, are based upon a knowledge of the chemical arts. No other manufacture brings so fully into play the results of scientific research and the practical applications of art, while the delicacy of its operations greatly increases the risks and adds to the cost of manufacture.

Still another obstacle in the way of success in the wool manufacture in the United States is the terms of sale which, as a rule, now prevail with those whose product finds the market through the commission houses. These terms of sale frequently compel the manufacturer to begin a season's manufacture before he has received his payment for the goods of the previous season, and only abundant capital can stand the strain of these conditions. The accumulation of goods in commission houses, the cancellation of orders for goods already manufactured or in process, the long credits, the risks of carelessness by operatives, all combine to make conditions under which it is not surprising that many fail, and it is not necessary to look beyond these conditions to find adequate explanation of the fact that the proportion of failures is larger in this branch of manufacturing than in any other.

The large percentage of idle machinery found during the census year thus has another explanation, which is perhaps the most comprehensive of all. The volume of capital which has been sunk in this branch of manufacturing will bear a larger proportion to the total capital invested than in any other. Instances are frequent where the money expended in equipping a woolen plant has been entirely lost before that plant has been finally brought to the point of earning a fair return upon the active capital required in its operation. In this way it happens that the New England and middle states are full of mills which have passed through many hands, and are only identified with the establishments reporting ten or twenty years previously, by the fact that they occupy the same premises.

It is apparent from this résumé of the conditions surrounding the wool manufacture that it is an industry in which success on any extended scale requires an unusual degree of intelligence and skill. This fact may explain in some degree the remarkable changes which have occurred in the personnel of those conducting it in the United States. The degree of this change has been shown to the special agent by a careful comparison of the lists of the manufacturers reporting to the censuses of 1870, 1880, and 1890. The changes in the names of these manufacturers indicate that the financial mortality among them has been frightful. The wool schedule contained an inquiry as to the date of establishment of each mill reporting; 2,377 replied to it, and the result of these replies shows that about 50 per cent of these establishments were organized in the last census decade, 1880–1890. While in numerous instances it is probable that the date of the reorganization of a mill has been improperly given as the date of its origin, yet the actual proportion is not far from that stated.

CAPITAL.

It is obvious that the amount of capital employed in the wool manufacture has never been fully reported. In 1880 it was given as $159,091,869, to manufacture products valued at $267,252,913. In 1890 it is reported at $256,494,481, not including value of hired property, to manufacture a product valued at $337,768,524, an apparent increase of 86.37 per cent in the capital, as against an increase of but 26.39 per cent in the value of products.

There was, in reality, no such increase in the capital employed. The actual increase was probably something higher than the increase in products, allowance being necessary in measuring the relations of the two items for the fall in values.

The more exact form of the inquiry of the schedule of 1890, in relation to capital, has led to a much closer return than ever before. In the special schedule relating to wool manufacture in 1880, this question read as follows:

58. Amount of capital invested in works and employed in business, including both fixed and active capital or surplus.

While this question apparently covers the same ground as the more detailed question of 1890, it is made evident by an inspection of the returns under it that it was not so regarded, and that materials and stock on hand and goods in process were as a rule overlooked, as proper items of active capital employed. Just to what extent they were overlooked it is impossible to say, because the census of 1880 did not classify the capital employed into the fixed capital invested in land, buildings, and machinery, and that required to carry on the business. We find the fixed capital thus invested in 1890 to be $129,721,571, or almost equivalent to the total amount of capital reported in 1880. This establishes the meagerness of the return of active capital in 1880.

The fixed capital represented $14,954,323 invested in land, $40,144,544 invested in buildings, and $74,622,704 invested in machinery, or in the proportion of 11.53 per cent invested in land, 30.95 per cent in buildings, and 57.52 per cent in machinery. In addition to the above, $17,320,780 of hired property was utilized in the wool manufacture, which is not included in the above statement of fixed capital. Of the three items, that of land is the one which contains the most elements of flexibility. There are many instances in which the land value is determined by the fact that the factory exists upon it. The wool manufacture is in many instances an isolated industry, often the

only one in the town, and its disappearance would take from the land the greater part of the value now nominally attaching to it. The status of the two industries of wool and cotton manufacturing presents a marked contrast in the matter of the capital invested in realty. The latter industry is more concentrated and is usually conducted in buildings more expensively constructed. While the product reported for the cotton manufacture has a value of $69,786,800 less than that of the wool manufacture, the capital invested in its plant is $101,271,996 in excess of that invested in wool manufacture.

On the other hand, when we turn to the live assets, we find the active capital employed in the wool industry $43,745,634 in excess of the similar items in the cotton manufacture. This fact is also in accord with well-known conditions surrounding the two industries. The conduct of the wool manufacture requires a larger capital than cotton, because of the much higher cost of the raw material employed, and of the longer time required to carry the stock through the various processes of the manufacture.

Of the active capital employed a large portion is borrowed money, and the amount of the liabilities of different mills varies greatly at different seasons, in accordance with the conditions at the time, whether it is at the beginning or the close of a season's operations. It is impossible under these circumstances to arbitrarily determine the total amount of active capital required to carry on this industry for a year of operations; but that the amount reached by this investigation, $166,772,910, is a fair average for the operations of the census year is determined by two tests.

First. It occupies the proper relationship to the fixed capital invested in plant. Most woolen mills will require active capital equal to or in excess of the cost of the investment to carry on operations. The proportions will vary in different mills, according to their methods, the state of their surplus, and the magnitude of their operations, but for a general average the above statement is correct.

Second. It is a general rule that a well-conducted wool manufacturing establishment will turn its active capital twice in a year. The value of the product here reported is a few million dollars more than double the $166,772,910 of active capital returned, and it therefore represents a value of product such as may be regarded by commercial tests as requiring that amount of active capital to produce.

Analyzed in this way, we find that the statement of capital invested is in keeping with all the other conditions, and it may therefore be claimed for it that it is an accurate presentation of this important and perplexing feature of census investigation. Hitherto the returns of capital have been abnormally low when measured by the collateral statistics. In the present investigation they show what would otherwise be an abnormal increase, the apparent increase being largely due to closer methods of inquiry in the later census.

The tendency in woolen manufacturing of late years has distinctly been in the direction of the corporate form of management, although it is much less marked in this industry than in the cotton manufacture. The Massachusetts census of 1885 shows that more than two-thirds of the cotton manufacturing establishments of that state were corporations, while of the woolen goods establishments nearly eight-tenths were private concerns. Over 95 per cent of the capital employed in Massachusetts cotton manufacturing was invested in a corporate form, and about 50 per cent of the capital employed in woolens was so invested. In other words, the very large woolen establishments are as a rule corporations, and the smaller mills are as a rule under private management. The figures for Massachusetts may be taken as a fair criterion of the conditions existing in other states. There is a prevalent opinion that the best results in wool manufacturing have hitherto been attained in this country under private management, and that this is due to the peculiar surroundings of the industry as contrasted with the cotton manufacture, which are commented upon in this report. Mr. Bond has written that nearly all the corporations engaged in wool manufacturing prior to 1857 had failed disastrously, many of them under stress of financial crises, which private mill owners successfully withstood, because their profits were not all distributed to stockholders in times of prosperity without sufficient regard to the great uncertainty peculiar to the industry. On the other hand, as competition grows closer and margins smaller, the advantages which spring from large capital and large product are becoming more defined.

EARNINGS OF CAPITAL.

These statistics do not show anything whatever regarding the profits made in the business of wool manufacturing. The schedule was so constructed, in its grouping of accounts current with the live capital or assets, as to prevent it from showing a true balance sheet of the business, and as a matter of fact it was impossible to determine from the individual schedules received whether the business had been conducted at a profit or a loss during the year covered by the report.

This statement is made in order to prevent any attempt, by adding together all the items of expense reported and subtracting the sum from the value of the goods made, to represent the remainder as the profits of those reporting. This remainder will have no closer relation to these profits than any other which might be arbitrarily fixed upon for that purpose, and for the reason indicated.

If thus figured, a result is shown equivalent to earnings of between 11 and 12 per cent on the gross value of the product, and even larger upon the capital invested. As a matter of fact, the gross profits of the wool manufacture will not average any such percentage, and the net profits, after sufficient allowance has been made for interest on plant, wear and tear, business losses, and the necessary replacement of machinery, will be still less.

DUPLICATION OF PRODUCTS.

Another aspect of the statistics may be properly brought to attention in the same connection, because it presents a second insurmountable obstacle in estimating the profits of wool manufacturing on the basis of the census returns.

Such an estimate is statistically impossible, for the reason that the value of product reported includes a large element of duplication. Thus many mills are engaged exclusively in the manufacture of yarns for sale, while others make yarns both for sale and for weaving by their own machinery. The yarns thus sold constitute the finished product of these manufacturers and therefore enter into the total value of products; but they are simply the raw material of their purchasers, and appear again in the column of products, plus the added value of their weaving and finishing.

The fact that the value of yarns purchased is added to the cost of materials purchased might seem at first sight to afford a fair offset and confirm the approximate accuracy of the method of calculation above stated; but inasmuch as this method involves a computation based upon two profits instead of one, the profit of the yarn spinner as well as the profit of the yarn weaver, the estimate of profits is statistically impossible. The amount and value of duplicated products are given under the topic of "Products" on page 47.

The limitations we are now considering involve no just criticism upon the value of census statistics of manufactures. These duplications are inevitable in any inquiry which treats an industry as a homogeneous whole, and follows it through the several stages in which the finished product of one mill becomes the raw material of another. They were pointed out by Superintendent Walker, in connection with the statistics of manufactures in the census of 1870, and they may be easily estimated, with substantial accuracy, for the purpose of ascertaining the net value of products as distinguished from their gross value.

MISCELLANEOUS EXPENSES.

Little explanation is required under this item of expenditure, which now appears for the first time in the census of wool manufactures. It covers all the expenses connected with the running of a mill, outside the cost of materials and labor, such as rent, taxes, insurance, ordinary repairs, interest on cash used in the business, and the countless sundry expenditures peculiar to the conduct of any manufacturing business. These miscellaneous expenses foot up $19,249,508, which is 6.44 per cent of the total expenditures of the mills reporting, the cost of materials used being 67.92 per cent and cost of labor 25.64 per cent.

The division of these miscellaneous expenses into their several groups is as follows:

Total	$19,249,508
Rent paid for tenancy	1,348,818
Taxes	1,174,793
Insurance	1,353,049
Repairs, ordinary, of buildings and machinery	3,179,531
Interest paid on cash used in the business	5,841,963
Sundries, not elsewhere reported	6,351,354

The amounts reported as paid for taxes and for insurance are nearly the same; but in both cases the returns were defective, and no averages can be based upon them. The amounts paid, both for taxes and insurance, are much greater than reported. To illustrate: Of 113 establishments reporting in the state of Ohio only 101 reported any taxes paid and only 80 reported insurance. Of 56 establishments reporting from Wisconsin, 51 reported the amount of taxes paid and 45 reported insurance. Of 82 establishments reporting from Maine, 68 reported the amount of taxes paid and 55 the annual cost of insurance. Several Maine establishments reported exemption from taxation under local ordinances, and this exemption exists, to a limited degree, in some other states. In the matter of insurance there are many smaller mills, particularly in the west, which carry none. Owing to the defective character of the returns under these heads it is a fair conclusion that the total of $19,249,508 returned as the sum of "miscellaneous expenses" in the manufacture is smaller, by several millions, than the actual annual expenditures of the industry for these purposes.

MACHINERY OF THE WOOL MANUFACTURE.

The best test of the growth of the wool manufacture is not the number of establishments or the relative value of the products, but the increase in the machinery capacity. The comparative figures are as follows, for 1890 and 1880:

MACHINERY.	1890	1880	Percentage of increase.
Cards	8,198	7,581	8.14
Combing machines	855	518	65.06
Spindles	3,182,500	2,254,096	41.13
Looms	69,807	59,261	17.80

These figures, however, afford only a general clew to the increase in machinery capacity between the decades, and there are serious difficulties in the way of applying any exact standard of comparison.

In the woolen manufacture proper the set of cards has been uniformly accepted in the United States as the unit of capacity, and it has been adopted for this census. In Great Britain and the continental countries the spindle is generally accepted as the unit in the wool manufacture as in the cotton industry, and no record of cards in operation appears in the limited statistics of foreign countries.

There can be no doubt that the spindle is an accurate unit of capacity so far as the worsted manufacture is concerned.

In the woolen manufacture practical men regard the card as the most accurate unit of capacity, for the reason that in spinning woolen yarns much stock is run twice on the mules to obtain fine numbers of yarns, and the number of spindles operated is therefore not an accurate test.

The returns of machinery to this census have been so taken that either the card or the spindle can be hereafter adopted as the measure of capacity in making comparisons. But the conclusion is forced upon us that no such thing as a uniform and accurate standard of the machinery capacity of the wool manufacture is possible.

Entirely different results follow from the application of the two standards, the card and the spindle, to the growth of the industry in the decade from 1880 to 1890. This is because the worsted manufacture, in which the card does not necessarily appear as an essential machine, has grown very much faster than the woolen manufacture proper. Thus, the total number of sets of cards reported in operation in 1880 was 7,581, and in 1890 8,198, an increase of 8.14 per cent, while the spindles reported in 1880 were 2,254,996, and in 1890 3,182,500, an increase of 41.13 per cent. The percentage was really larger, as many cotton spindles reported with woolen and worsted spindles in 1880 are now reported with cotton manufacture.

CARDING MACHINES.

The difficulty with the card, as a unit of machinery capacity, arises from the diversity of the carding engine in capacity, in structure, and in use. No other evidence of this is required than the fact that the number of sets of cards reported by the census of 1870 was 9,224, and in 1880 it was only 7,581, but the actual production of our woolen mills in the latter year was far in excess of their production in 1870. This was partly because a larger proportion of the carding machines reported in 1880 were the one-cylinder machines employed in custom carding, the number of which has been rapidly decreasing as the household industry has been superseded.

The actual capacity of the regulation set of cards, with three cylinders, has also been greatly increased. As the carding engine is long-lived and expensive many of the older types remain in operation, particularly in the smaller mills, and their productive capacity is hardly one-half that of modern machines of nearly double their width and of greater diameter. The great improvements in the American system of wool carding date from about 1860. At that time the machines in common use were mounted on wooden frames, the main cylinders being 40 inches wide and 42 inches in diameter. During the civil war a few iron doffers, and then iron strippers, began to be made, after which the workers were made of iron. The cylinders are now frequently 60 inches in width and 48, 54, and 60 inches in diameter. The capacity of carding machines has been further increased by taking off a larger number of ends from the finisher cards, using narrower rings, thus allowing more material to run through the breakers.

An analysis of the returns at this census shows the following results as to the prevailing present width of cylinders:

NUMBER AND WIDTH OF CARDS, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	Actual number of sets in each state.	Number reporting width.	NUMBER OF CARDS OF EACH WIDTH REPORTED.								
			24 inches.	30 inches.	36 inches.	40 inches.	48 inches.	54 inches.	60 inches.	72 inches.	Miscellaneous.
Total	8,198	8,077	445	126	174	2,080	4,156	19	1,013	10	54
Alabama	8	8	4	1	.....	1	2	.....	.....	.....	.....
Arkansas	7	7	5	.....	1	1	.....	.....	.....	.....	.....
California	70	70	.....	.....	.....	15	55	.....	.....	.....	.....
Connecticut	646	646	18	.....	.....	180	432	.....	14	.....	2
Delaware	15	15	.....	.....	.....	.....	4	.....	11	.....	.....
Georgia	22	22	11	.....	.....	.....	9	.....	2	.....	.....
Idaho	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Illinois	71	71	3	5	2	23	30	.....	8	.....	.....
Indiana	153	150	15	3	.....	34	69	1	28	.....	.....
Iowa	36	36	2	1	2	17	14	.....	.....	.....	.....
Kansas	1	1	.....	.....	.....	.....	1	.....	.....	.....	.....
Kentucky	104	104	27	4	1	6	28	.....	38	.....	.....
Louisiana	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Maine	387	385	19	5	13	159	181	.....	8	.....	.....
Maryland	30	30	3	.....	3	3	2	.....	19	.....	.....

NUMBER AND WIDTH OF CARDS, BY STATES AND TERRITORIES: 1890—Continued.

STATES AND TERRITORIES.	Actual number of sets in each state.	Number reporting width.	NUMBER OF CARDS OF EACH WIDTH REPORTED.								
			24 inches.	30 inches.	36 inches.	40 inches.	48 inches.	54 inches.	60 inches.	72 inches.	Miscellaneous.
Massachusetts	1,837	1,808	29	.....	34	501	1,162	7	71	3	1
Michigan	68	68	14	5	1	17	25	.....	6	.....	.....
Minnesota	37	37	6	8	3	18	2	.....	.....	.....	.....
Mississippi	31	31	3	.....	3	4	10	.....	11	.....	.....
Missouri	52	52	18	6	2	9	12	.....	5	.....	.....
New Hampshire	492	481	5	1	6	281	176	3	7	1	1
New Jersey	235	235	1	7	5	4	164	.....	48	.....	6
New York	1,403	1,401	68	7	23	533	637	.....	88	6	39
North Carolina	35	28	9	6	4	4	3	2	.....	.....	.....
Ohio	112	112	26	11	6	28	27	1	8	.....	5
Oregon	21	21	1	.....	.....	2	18	.....	.....	.....	.....
Pennsylvania	1,290	1,233	87	24	36	96	428	1	561	.....	.....
Rhode Island	572	572	.....	1	14	52	476	3	26	.....	.....
South Carolina	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	3	3	1	.....	.....	1	1	.....	.....	.....	.....
Tennessee	80	79	27	8	4	9	14	.....	17	.....	.....
Texas	9	9	1	.....	.....	2	2	.....	4	.....	.....
Utah	31	31	5	1	1	2	22	.....	.....	.....	.....
Vermont	157	157	10	.....	3	32	96	.....	16	.....	.....
Virginia	60	60	1	14	3	15	21	1	5	.....	.....
West Virginia	42	42	17	1	4	14	5	.....	1	.....	.....
Wisconsin	69	69	6	7	.....	17	28	.....	11	.....	.....

This table demonstrates the insufficiency of the card as a unit of measurement by bringing out the great disparity in the width; that is, the capacity of the cards in operation. Of the 1,013 60-inch cards reported, 561 were located in the state of Pennsylvania, which indicates that the manufacturers of that state have been enlarging the capacity of their machinery more rapidly than those located elsewhere.

In 1880 and 1890 the special schedule contained an inquiry intended to reveal, in the one case, the average capacity per set of cards in pounds of clean wool, and in the other the average consumption per set, reckoned on full time, in clean stock as prepared for the cards. Mr. Bond tabulated and published the replies received to this question. They were also tabulated for the present census; but examination of the results made it evident that they were of little value, and they have therefore been abandoned.

The purpose was to obtain a basis for an estimate of the machinery capacity of the country in excess of its actual consumption. Mr. Bond's figures throw no light on this question, for the reason, among others, that they take no cognizance of the cotton, shoddy, and other materials passing over the cards in admixture with wool. Any statistics which depend upon so many diverse and constantly varying conditions might as well not be attempted. According to Mr. Bond's tables the average daily capacity of the woolen cards in 1880 was 764,000 pounds, or an average of 128 pounds per set per diem. By the present returns the average daily capacity of consumption, reckoned on full time, was 1,124,361 pounds, or 174 pounds per diem per set of cards. This was for the number of mills reporting, which did not include many of the smaller mills. Inquiry of manufacturers establishes that the average capacity of a modern set of cards varies from 100 to 300 pounds per day, being dependent upon the quality of stock and the purpose for which it is to be used. This statement, founded upon individual experience, is worth more than any averages obtained from the returns made by individual manufacturers engaged upon every variety of work.

It is clear from the above that the average capacity of woolen cards, as operated in 1890, was considerably in excess of their average capacity in 1880; and also that the actual capacity of our woolen mills as now organized is greatly in excess of their output, as was also the case in 1880. How much this output could have been exceeded had the demand for the goods existed it is impossible to say on the data obtained.

COMBING MACHINES.

The great increase in the machinery capacity of the United States between 1880 and 1890 has come through the introduction of worsted machinery, which has in many mills taken the place of the woolen card. No other phase of the manufacture so well demonstrates its development. In 1860 the number of combing machines was confined to the equipment of the 3 establishments engaged in the manufacture of worsted stuff goods, and a few carpet yarn spinners. In 1870 we had but 261 combing machines in the whole country. The census of 1880 reported 518 combing machines, an increase of 98.47 per cent over 1870, and the census of 1890 shows 855, a further increase of 65.06 per cent over 1880.

A combing machine, with its accompanying preparatory machinery, is estimated to equal the productive capacity of from 2 to 3 sets of cards. (*a*) On this basis the worsted machinery of the country was equivalent in its capacity to one quarter of the capacity of the woolen machinery, an estimate borne out by the relative consumption of raw materials and the relative value of products.

Of the 855 combing machines in use in 1890, 181 were of American manufacture, as compared with 134 in 1880, showing that the American manufacture of combing machines had gained but slightly in the ten years. There were 91 American made combing machines employed in the carpet manufacture in 1880, and but 41 in 1890.

The comb is one of the most delicate and expensive machines employed in the textile industries, and the efforts of the American builders to supply the home market have been hampered by the fact that the English makers have had a much longer experience with them. The preparatory machinery used in connection with the comb is now very largely manufactured in this country. Of the machinery connected with the card, practically all is made in the United States.

Although the development of industrial mechanism may be substantially the same in different countries, yet in each it shows peculiarities having their origin in each. Thus, the French system of spinning had its origin in the peculiarities of Heilman's combing machine, as contrasted with the English combing machines invented about the same time. It differs from the English method particularly in the drawing processes; the sliver is never twisted, but is only drawn out, at the same time that the fibers are constantly kept in a state of parallelism by passing over a circular comb. Each method has its advantages over the other. M. Charles Leroux, a French expert in worsted spinning, writes that while English yarns are sold in the French markets at lower prices than the French yarns, this is true only of the coarser numbers, and he adds, "a convincing proof of the superiority of the French method of spinning over the English method is that they have vainly attempted to spin cashmere yarn in fine numbers upon their frames in competition with us. Their mode of preparing wools for the process of spinning is not adapted to these numbers". One of the evidences of the advancement of the American manufacture into the higher branches of the industry during the last decade has been the equipment of several large mills with machinery adapted to the French system of spinning.

A distinction also exists between the carding machinery of England and the United States, but it results in no essential difference in processes. It is simply a difference in structure, due to the independent evolution of the carding engine in the two countries. The English carding machinery consists of a scribbler, containing two swifts, an intermediate, also with two swifts, and a carder, containing two swifts and a condenser. The American system has the same set of three machines (called here the first breaker, second breaker, and finisher), but each engine carries but one swift or cylinder. Similar structural differences exist in the apparatus for spinning woolen yarns employed in the two countries.

SPINDLES.

Table 4 indicates the number of spindles actively employed in the wool manufacture in 1890 as 3,182,500, as compared with 2,254,996 in 1880, an increase of 41.13 per cent.

This total number of spindles was subdivided into 2,329,099 woolen spindles, 657,324 worsted spindles, and 196,077 cotton spindles. Of the woolen spindles, 1,742,288 were located in woolen mills proper, as compared with 1,720,820 so located in 1880. Of the remainder, 207,180 were located in worsted mills and 312,756 in hosiery and knit goods mills, with 53,046 in carpet mills and 13,829 in felt mills. The worsted spindles were located: 479,675 in worsted mills, 151,132 in carpet mills, 19,750 in woolen mills, and 6,767 in hosiery and knit goods mills. This location of spindles illustrates how closely intertwined are the two branches of woolen and worsted manufacture, and why it is impossible to make an absolute statistical separation of these two branches.

The cotton spindles were located: 68,225 in worsted mills, 69,830 in hosiery and knit goods mills, 53,342 in woolen mills, and 4,680 in carpet mills. In the former case the spindles were employed almost wholly in spinning cotton-warp yarn for worsted dress goods and suitings. They were far from equaling the consumption of these mills

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a The estimates of practical manufacturers vary on this question, the variation being due to the different qualities and varieties of wool used and numbers of yarn to be spun. The following replies to letters of inquiry are submitted:

WANSKUCK MILLS,
PROVIDENCE, RHODE ISLAND, March 15, 1892.

Yours of the 14th instant at hand. One wool card, 48 inches, will use about 80 pounds of stock per day, and one Noble comb on the same stock will comb twice as much.

Yours truly,

JESSE H. METCALF, *Superintendent.*

PROVIDENCE, RHODE ISLAND, March 15, 1892.

A set of woolen cards 48 inches wide, making roving for an 8-run yarn with 48 rings, will produce from 75 to 80 pounds per day, and a card using a Bollette condenser would produce on the same work from 90 to 100 pounds per day. A Noble comb, making tops for 23 worsted yarn, would produce about 350 pounds per day. These figures are based on a very fine grade of wool, such as we would be obliged to use to spin up to 8-run yarn.

Yours truly,

PROVIDENCE WORSTED MILLS.

UTICA, NEW YORK, March 15, 1892.

The consumptive capacity of 1 set of woolen cards 48 inches wide, making roving for 8-run yarn as we run them, would be about 100 pounds per day, and of one Noble comb, making tops for No. 23 worsted yarn, would be about 350 pounds per day.

Yours truly.

ROBT. MIDDLETON, *President.*

in cotton yarns, as is shown by the total of 9,454,874 pounds of such yarns purchased for the use of the worsted mills. In large degree these latter yarns were simply transferred from the cotton to the worsted branch of the same general establishments. The cotton mills connected with such establishments as the Arlington, the Pacific, the Manchester, and the Lorraine mills are returned under the cotton census, and only figure here in the item of cotton yarns purchased. This method of separation was not pursued in the census of 1880, and that census took no account of the number of cotton spindles in operation in woolen and worsted mills, but grouped them all either as woolen or worsted spindles.

The hosiery and knit goods establishments operated 69,830 cotton spindles exclusively upon cotton hosiery yarns. How far behind their consumption of cotton yarns was the spinning capacity of this class of mills is shown by the purchase of 32,248,849 pounds of cotton yarns for use in manufacturing hosiery and knit goods. These mills largely rely upon spinning mills for their yarns, their purchase of 6,386,370 pounds of woolen yarns and 4,146,035 pounds of worsted yarns, in addition to the cotton yarns above stated, indicating that their consumption of yarns was about 30 per cent greater than their own product.

DOUBLING SPINDLES.

No separation of spindles into spinning and doubling spindles was called for on the schedule. In the English returns, under the "Factories and workshops act", this separation is made. In the woolen mills of Great Britain, in 1889, there were 3,107,209 spinning spindles and 299,793 doubling spindles, showing a proportion of 10.36 to 1. In the worsted mills there were 2,402,922 spinning spindles in the same year, and 669,328 doubling spindles, showing a proportion of 3.59 to 1. If the same proportion exists in the United States, and it must be approximately the same, the division of the spindles reported would be as follows:

SPINDLES.	Woolen.	Worsted.
Total	2,329,099	657,324
Spinning	2,124,073	514,116
Doubling	205,026	143,208

Spinning in woolen mills is performed upon the mule and in worsted mills upon the spinning frame where the English system is employed and upon the mule with the French system. There have been no radical changes in the method of spinning woolen yarn since the adoption of the self-acting mule, although slight changes in the mechanism have perceptibly increased the efficiency of the machinery. In all American mills down to the close of the civil war the spinning continued to be done on the hand-jack, which is still found in many of our smaller mills. In this respect American mills were some twenty-five years behind those of Great Britain. Automatic mules of English make were imported and their use was attempted, but not with satisfactory results. The English machines, being adapted to spinning uniform numbers, were ill adapted to the needs of the American manufacturer at that time, compelled as he was to use yarns of different numbers adapted to a variety of products. Several American inventors, working independently, succeeded in so far perfecting the automatic mule that a number were put in operation about 1868, (*a*) the first, it is believed, in the Chase mill at Webster, Massachusetts,and gradually several machines were perfected, which are peculiar to America and better adapted to the needs of the industry here than the spinning apparatus of any other country. The introduction of the automatic mule, which became general between the years 1870 and 1875, has enormously facilitated the manufacture.

It is stated by careful manufacturers that the substitution of the automatic or self-acting mule, with the improved machinery which has come during the same period, has resulted in a gain of from 33 to 50 per cent in productive capacity. The economic gain in the expenditure of labor is even more striking, two persons now easily accomplishing as much as four on the hand-jack. Experts have calculated the difference between hand-jacks and mules in the cost of manufacture as follows: 48 cents per 100 runs of yarn, with the jack; 20 cents with the mule, or less than one-half. There is also a great saving in the waste and a great gain in the uniformity of the product.

The hand-jack carries 140 to 240 or 300 spindles, revolving from 3,000 to 4,000 times a minute. Mules carry usually 300 to 480 spindles, but the number is now sometimes increased to 600. The number of revolutions is about the same.

In the organization of a woolen mill with one set of cards, from 10 to 15 horse power is required, which will keep from 300 to 500 spindles in motion; but this relationship varies greatly, according to the class of goods manufactured, the age of the machinery, and the capability of superintendents. American woolen mills vary in their equipment all

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a Several authorities place the date of the introduction of the automatic mule several years earlier. Mr. William B. Weeden, of the Weybosset Mills, writes the special agent as follows:

PROVIDENCE, February 1, 1893.

DEAR SIR: In respect of automatic mules for spinning wool, several patterns of cotton mules were rudely adapted to that work in Lawrence and Manchester during the war, or as early as 1863. About the same time woolen mules were imported from England. Seth D. Paul adapted the Sharp and Robert pattern to the work of spinning wool. The Saco Water Power Machine Company built these automatic woolen mules, and a pair was started at the Weybosset mills in March, 1865. Machines of this description ran successfully for many years. Paul, who was an earnest and capable mechanic, afterward developed a pattern of his own, less complex and better adapted for spinning wool.

Truly yours, WM. B. WEEDEN.

the way from one to seventy sets of cards, and from 240 to 25,000 spindles. One set of cards will supply an average of four broad looms.

The frame spinning of worsted yarn is the same in the United States as in Great Britain, and is chiefly done on frames of English manufacture.

LOOMS.

Table 4 also contains the details of looms in operation during the census year. The total number of looms was 69,807, as compared with 59,261 in 1880, an increase of 17.80 per cent, a smaller percentage of increase than is shown in other machinery, with the exception of cards, because looms are not employed in the hosiery and knit-goods branch. Moreover there has been a large increase in the productive capacity of the modern loom as compared with other mill mechanism. There were found in operation in 1890 but 3,076 hand looms, as contrasted with 4,776 in 1880. In woolen and worsted mills, these hand looms were employed chiefly as pattern looms, and were only occasionally in operation. The remainder were in carpet mills, where the ingrain hand looms numbered 631, with 4,214 power looms, while the Venetian hand looms numbered 157, with 109 power looms.

The change from narrow to broad looms has been going on very rapidly. We had in 1890, 20,848 broad looms on woolen goods, and in 1880, 15,188. In 1890 there were 17,653 narrow looms on woolen goods, as compared with 17,733 in 1880. Practically the number of narrow looms remained the same, while the number of broad looms increased about 37 per cent. In worsted goods the change is not so marked, for the reason that ladies' dress goods continue to be made as a rule in the narrow widths. The broad looms employed on worsted goods in 1890 numbered 8,482, as compared with 2,612 in 1880, and the narrow looms numbered 11,447, as compared with 9,073 in 1880.

Very few narrow looms have been made for men's-wear weaving for twenty years past, and it is a safe statement that the number reported as still existing in woolen mills have been in operation for that length of time.

There is no department of the manufacture where the possibilities of greater economy of production are so marked as in the American weave rooms, a fact attested by the statistics given above. Many mills are filled with old looms which are incapable of successful competition with the splendid machines, with their stop motions, power pick-finding devices, etc., now turned out by the American loom manufacturers. Up to 1857, broad looms were run at about 45 picks per minute. In that year appeared a Crompton fancy loom, with 24 harness capacity, and 3 shuttle boxes at each end, operating at a speed of 85 picks per minute. This was a great stride in production, and no advance has since been so great. Other improvements since introduced by the Knowles Loom Works and the Cromptons have made it possible to speed broad looms up to 90 and 95 picks per minute, and in some instances to 100 and 105 picks. The various devices for facilitating production enable a larger production to be had from the looms now manufactured than the difference in speed alone would indicate, and some manufacturers estimate the gain in production as equal to 100 per cent in the last thirty years.

Looms of American pattern and improvement are now very largely used in England, and their superiority to the looms of other countries is conceded. These improvements have resulted in a greater regularity in the product, less waste of material, and greater saving of labor; one weaver in the lighter fabrics easily attending to two and even four looms. The power loom is worked without muscular effort; dexterity in the repairing of broken yarns being the chief requirement of the operative; consequently, women have largely superseded men in its operation.

The loom completes the category of machinery employed in the wool manufacture proper, so far as the census takes cognizance of it. The great variety of machinery employed in the finishing processes of the manufacture bears no relation to the statistical development of the industry, as it varies in every mill according to the peculiarities of the products upon which that mill is employed. It may be said generally of this machinery that very rapid progress has been made in the last twenty years, quite as marked, indeed, as in either of the mechanical departments we have been considering. In the finish of their goods, so that in appearance and "feel" they will compare favorably with goods made abroad, the American manufacturers have been learning very rapidly of late years, impelled thereto by a realization that this is the chief point at which their products have failed in the past in comparison with the wool manufactures of European countries.

THE INCREASE IN EFFICIENCY.

The absence of any uniform unit of measurement makes impossible a scientific and exact statement of the increase in efficiency in modern machinery. Another obstacle to such a comparison grows out of the irregular introduction of improved machinery. Writing on this subject to Special Agent Joseph D. Weeks, of the Tenth Census, in connection with his report on the statistics of wages for that census, Mr. George William Bond said:

> The progress of mechanical improvements has been continuous, and those establishments only have been really successful which have had the courage to abandon their old machinery as fast as improved forms have proved to be of real importance. Much of this rejected machinery has been sold to factories in distant parts of the country which were pioneers in the wool manufacture in their respective localities, and it is this that has caused many of the failures in such attempts.

The efficiency of labor has not perceptibly increased as a consequence of the increased efficiency of machinery. The tendency has rather been the other way, the improvements in spinning and weaving machinery particularly making it possible to substitute female labor for that of men. This labor is constantly shifting and changing, a tendency which operates to prevent any marked advance in its general efficiency.

Neither has the improved machinery resulted on the whole in reducing the average wages. So large a portion of the work in the wool manufacture is piecework that the general tendency has been to increase the earning capacity of individuals so employed by permitting a greater increase of product as the result of their labor.

IDLE MACHINERY.

Thus far we have been dealing only with the woolen and worsted machinery in actual operation during the census year. This is the first census that has differentiated the active and the idle machinery of the wool manufacture. The proportion of machinery absolutely idle was 6.95 per cent of the whole number of sets of wool machinery; a larger percentage would be required to indicate the productive capacity of our wool mills in excess of the actual output reported. The present statistics afford no clue to the proportion of machinery which was idle in mills partially in operation. As a matter of fact, this proportion was unusually large in 1889; for during the whole of the census year the wool manufacture labored under a depression to a degree not equaled since 1874.

Many mills, in reporting to the census of 1890, indicated one-fourth or one-third of their machinery capacity as not in operation at the time the report was made. While information of this character was too meager to be tabulated, it was evident that the machinery capacity of the country was equal to a production at least one-fifth greater than the actual product reported, including in this estimate the 7 per cent of machinery absolutely idle.

The total productive capacity of mills is limited by the necessity of changing for seasonable work, in mills making both light and heavy weight goods; by the changes in styles, affecting continuity of output, by extra time permitted in some states and limited or practically forbidden in others, and by other causes which might be adduced, which apply particularly to wool manufacturing. There has been no time since the civil war when the machinery capacity of this industry was not in advance of the normal demand of our people for goods.

The character and location of this idle machinery is shown in Table 16. It will be seen that it represented a capital of $6,100,860, actually invested in lands, buildings, and machinery, and exclusive of all active capital, which may be assumed to have been wiped out of existence to an equal amount, in the case of these 267 establishments which had ceased operations. The greatest number of these idle woolen mills was found in the state of Pennsylvania, where 47 establishments represented inactive plants worth $1,265,460, with 116 sets of cards and 23 combing machines; Massachusetts came next, with 43 establishments, representing plants worth $1,184,110, and New York third, with 36 establishments, representing $899,711 capital tied up in plant. The table does not indicate that this idle machinery was peculiar to any locality, but it was distributed somewhat uniformly throughout the United States, in proportion to the actual investment in the several states.

If any exception is to be made to this rule it is in the case of California, where nearly one-third of the mills in existence were idle during the census year. Twenty years ago the wool manufacture took a firm root on the Pacific coast, and for a time promised to become one of the leading industries of that part of the country, particularly in blankets of such a superior quality, that they met with a large and ready sale in the East. It also aimed to supply the local demand for the cheaper fabrics for men's wear, stimulated thereto by the high rates of freight which prevailed. The census of 1890 shows a considerable decline in the value of the woolen goods manufactured in California. The report on the internal commerce of the United States for 1890, compiled by the chief of the bureau of statistics of the Treasury Department, contains a résumé of the condition of wool manufacture in California, supplied by State Labor Commissioner Tobin, from which we make the following extract:

> The woolen industry of California is at present on the decline, and the outlook is not hopeful. Millions in capital have been invested in the business, but the return was not sufficient to warrant the operation of more than two-thirds of the mills. Various causes are assigned for this condition of affairs; and chief among them are high wages, the high price of coal, and high freight rates. It is true that all classes of manufacture labor under similar disadvantages, but the disparity between the cost of production in California and the expense of turning out the same goods in the east is particularly noticeable in this industry. The result has been that eastern manufacturers undersell the local producers, to the ruination of California trade.

In a general way each of the reasons here assigned for the decline of the wool manufacture in California may be accepted as correct. An examination of the wage tables of this report shows that the prevailing rates of that state are uniformly higher than in the east, while the difference in the cost of fuel is even greater. The condition of the industry in California is only an exaggerated instance of the fact that under the improved methods of the modern factory system the tendency of this industry to concentration has become marked, and that concentration results in certain well-defined advantages, in the direction of cheaper production, which must perpetuate that tendency.

Except in isolated cases, as in California, the idle woolen mills discovered by the Eleventh Census were old mills, whose machinery was antiquated, and whose failure was primarily due to lack of the capital necessary to equip them for competition under modern conditions. It is only a question of time before mills which are employing obsolete machinery, without the capital to renew it, must succumb to the pressure of this competition. The margin of profit has greatly decreased. Conditions are thus establishing themselves radically different from those which governed in this industry during the first seventy-five years of our existence as a nation. In respect to nearly all of these idle establishments, therefore, it may be taken for granted that they were permanently idle, except in the contingency of an entire new machinery outfit. Many of them were located upon valuable water powers, and their rehabilitation is only a question of time. A number of them have already been re-equipped and put into operation since these statistics were gathered.

The statistics of idle mills include no establishments denuded of machinery or converted to other industrial purposes. The eastern and middle states are full of buildings and sites formerly occupied by carding mills, fulling mills, and small woolen mills, which long since ceased to be considered in connection with inquiries of this character.

ALLOWANCE FOR DEPRECIATION.

In the same connection the question of the allowance for repairs and depreciation in buildings and machinery may be considered. The returns under this question presented no uniformity, and nothing approaching a uniform rule exists in the wool manufacture. The conditions governing the industry are so diverse and the methods of manufacturers so different, that it is impossible to establish any average. There are certain large establishments in New England which calculate to renew their entire machinery plant as often as every ten or fifteen years to keep themselves abreast with the most modern conditions of manufacturing. In these cases there was reported an average annual allowance of 10 per cent on the cost of plant, to cover depreciation and renewals. The average allowance reported runs from this figure down to 7 per cent, 5 per cent, 3 per cent, 2 per cent, and 1 per cent. Thus, in the state of Massachusetts, 33 establishments reported their allowance for depreciation and renewals of buildings and machinery at 2½ per cent or less, 33 reported their allowance at 5 per cent or less, 20 at 7½ per cent or less, 18 at 10 per cent or less, 4 at 12 per cent or less, and 4 at 15 per cent or more. In most of these cases the actual sum expended for new equipment during the census year was stated. Only 112 of the 336 Massachusetts establishments reporting made any return to this question, and in many mills the item does not figure in the bookkeeping. There are plenty of mills where the method is to run the machinery just as long as it will hold together. This fact is brought out in the annual report of the chief of the Massachusetts Bureau of Labor Statistics for 1890, in which the average cost of new equipment as returned to him by 141 woolen mills was 0.46 per cent, and by 17 worsted mills 0.98 per cent. These low figures could only have been obtained in consequence of the failure of a considerable proportion of the establishments reporting to make any allowance whatever for this item.

The machinery and processes of the wool manufacture are so different from those of cotton, and so complicated and numerous in comparison, that it is impossible to establish any standard, as may be done in that industry, upon which to predicate an average allowance for depreciation. But certain general principles govern the case, which will readily be admitted. The tenure of life of machinery is limited, no matter how well it may be kept in repair. In addition to the regular wear and tear, there is supersession by improvements, which is of far greater consequence, but which can not always be anticipated and which follows no fixed rule. Allowance must be made for it in considering the cost of carrying on the manufacture, and this allowance must be made even where the manufacturers themselves do not make it, if the theory is that the industry is to be carried on in the highest state of efficiency.

The average life of the entire mechanical equipment of a woolen mill is commonly estimated at twenty years, but some machines require to be replaced much more frequently than others. A set of woolen cards may last forty or fifty years with good care, but the clothing on them must be renewed every five or six years. Looms sometimes last thirty years, but their average life is less than twenty, while twenty years will represent the average life of a spinning mule. The various processes involved in the manufacture of all grades of the best woolen goods number between thirty and forty, and nearly every one of these processes requires the employment of one or more separate machines, which are subject to constant change by reason of improvements.

POWER.

The increase in the efficiency of power used in the wool manufacture has been very marked in the decade. This is shown by the following table, in which is given the total horse power, steam and water, in each branch of the industry, at each census, the average number of employés and the amount of horse power per employé. The greatest increase in power is shown to have occurred in worsted mills.

POWER AND LABOR: 1890 AND 1880.

INDUSTRIES.	Year.	Total horse power.	Average number of employés.	Horse power per employé.
Woolen goods	1890	122,224	79,351	1.54
	1880	106,507	86,504	1.23
Worsted goods	1890	49,117	43,593	1.13
	1880	16,437	18,803	0.87
Carpets	1890	22,677	29,121	0.78
	1880	10,491	20,371	0.51
Felt goods	1890	5,051	2,266	2.23
	1880	2,631	1,524	1.73
Wool hats	1890	3,295	3,592	0.92
	1880	3,992	5,470	0.73
Hosiery and knit goods	1890	34,368	61,209	0.56
	1880	11,561	28,885	0.40

Electric and other power, except steam and water, is excluded from the above table, because so large a portion of it is used for lighting. The use of electricity for power has not yet become marked. The increased use of steam, as compared with water, is the distinguishing feature of the statistics of power.

RAW MATERIALS OF THE MANUFACTURE.

WOOL CONSUMPTION.

The consumption of wool in the census year (exclusive of foreign yarns, mohair, alpaca, and other hairs) was 372,797,413 pounds, "in condition purchased", as contrasted with 296,192,229 pounds in 1880, an increase of 25.86 per cent.

It is impossible to ascertain the exact number of pounds of raw wool consumed in the industry, because it is purchased in the greasy state, in the washed state, and in the scoured state, and the figures above given represent purchases in all of these conditions.

The bulk of the domestic wools are now marketed in the greasy state. The quantity sent forward washed becomes smaller each year, and is confined largely to the clip of the middle states. The quantity of scoured wool purchased by the manufacturers is increasing steadily, as wool-scouring establishments, a comparatively new branch of the industry, increase in number and capacity. In his report of the wool manufacture for 1880, Mr. Bond said with reference to this fact: "It is estimated that from 10,000,000 to 15,000,000 pounds should be added to the domestic wool reported, and from 2,000,000 to 3,000,000 pounds to the foreign, to reach the true consumption". The habit of buying scoured wool has become more general during the last ten years, and the present special agent estimates the allowance now necessary in both domestic and foreign at 25,000,000 pounds, in order to reach the true consumption of wool as it originally came to market.

For the year 1889 the Agricultural Department places the clip at 265,000,000 pounds in the grease, including pulled wool, while the census shows that for the nearest corresponding year the wool manufacture consumed 258,680,801 pounds of domestic wool, in all conditions, a difference of but 6,319,199 pounds, which difference is not equal to one-quarter of the shrinkage represented in the washed and scoured wool purchased by the manufacturers.

Allowance must also be made for the quantity of wool annually grown which never reaches the markets, but is consumed in the household.

Again, of the mills reported as idle during the census year, a number were in operation during a portion of that year, but it was impossible to obtain any data of their operations during that limited period. They must have consumed several million pounds of domestic wool.

FOREIGN WOOL CONSUMED.

The consumption of foreign wool of all descriptions (exclusive of imported yarns) appears as 114,116,612 pounds in 1890 as compared with 73,200,698 pounds in 1880, an increase of 40,915,914 pounds, or 55.90 per cent.

The general accuracy of the census returns is attested by the statistics of the imports of foreign wool, shown in the following table, prepared by the Bureau of Statistics of the Treasury Department, which gives the imports of wool since 1870, compared with the domestic clip, and the percentage of foreign wool entered for consumption as compared with the domestic clip:

WOOL PRODUCED AND IMPORTED, DOMESTIC EXPORTS AND ANNUAL SUPPLY OF THE UNITED STATES, 1870–1890.

YEARS.	Domestic production, Department of Agriculture. (Pounds.)	Imports entered for consumption year ending June 30. (Pounds.)	Total production and imports. (Pounds.)	Domestic exports year ending June 30. (Pounds.)	Net supply. (Pounds.)	Per cent of imports to supply.
1870	162,000,000	38,634,067	200,634,067	152,892	200,481,175	19.27
1871	160,000,000	50,174,056	210,174,056	25,195	210,148,861	23.88
1872	150,000,000	94,315,933	244,315,933	140,515	244,175,418	38.63
1873	158,000,000	84,212,582	242,212,582	75,129	242,137,453	34.78
1874	170,000,000	56,793,737	226,793,737	319,600	226,474,137	25.08
1875	181,000,000	51,686,294	232,686,294	178,034	232,508,260	22.23
1876	192,000,000	40,275,678	232,275,678	104,768	232,170,910	17.35
1877	200,000,000	40,114,394	240,114,394	79,599	240,034,795	16.71
1878	208,250,000	39,801,161	248,051,161	347,854	247,703,307	16.07
1879	211,000,000	40,102,642	251,102,642	60,784	251,041,858	15.97
1880	232,500,000	99,372,440	331,872,440	191,551	331,680,889	29.9C
1881	240,000,000	67,416,967	307,416,967	71,455	307,345,512	21.94
1882	272,000,000	63,016,769	335,016,769	116,179	334,900,590	18.80
1883	290,000,000	53,049,967	343,049,967	64,474	342,985,493	15.47
1884	300,000,000	87,703,931	387,703,931	10,393	387,693,538	22.62
1885	308,000,000	68,146,652	376,146,652	88,006	376,058,646	18.12
1886	302,000,000	107,910,549	409,910,549	146,423	409,764,126	26.33
1887	285,000,000	114,404,173	399,404,173	257,940	399,146,233	28.66
1888	269,000,000	97,231,267	366,231,267	22,164	366,209,103	26.55
1889	265,000,000	126,181,273	391,181,273	141,576	391,039,697	32.27
1890	276,000,000	109,902,105	385,902,105	231,042	385,671,063	28.50

The degree of our dependence upon a foreign wool supply is accurately ascertained from the year 1821. Prior to that time the records of the Treasury Department were not kept in a manner that permitted any definite statement regarding it. In American State Papers, Class IV, Commerce and Navigation, volume 11, appears a special report of the Secretary of the Treasury in response to a resolution of the House of Representatives, asking for a report "showing the quantity of wool imported into the United States during the years 1817, 1818, 1819, 1820, and the first three-quarters of 1821". The Secretary submitted what data he could furnish, but added that the statements were necessarily imperfect, because the duty being ad valorem, no record of weight was preserved in the custom houses. Then appear the following figures:

	ANGORA, CAMEL'S, VICUNA, ETC., FREE.		SHEEP'S WOOL (15 PER CENT).	
Years.	Pounds.	Value.	Pounds.	Value.
1817	6,600	$6,189	2,272	$1,883
1818	1,500	226	.....	.....
1819	1,700	1,407	1,192	479
1820	.....	.....	106,788	24,965
1821 (three-quarters)	2,622	2,250	384,333	93,829

After the year 1821 the record is complete, and is much more accurate than any data we possess regarding the domestic clip. The following table shows the quantity and value of all foreign wool entered for consumption from 1822 to 1890, inclusive:

IMPORTS OF FOREIGN WOOL, 1822 TO 1890 (*a*).

YEARS.	Quantity (fiscal year). (Pounds.)	Value.	Quantity (5-year periods). (Pounds.)	Value.	Quantity (10-year periods). (Pounds.)	Value.	INCREASE IN QUANTITY AND IN PER CENT. (POUNDS.) 5 years.	10 years.
1822	1,715,690	$387,312						
1823	1,673,348	340,956						
1824	1,291,400	353,367	6,736,205	$1,633,704	.....	.....	.....	.....
1825	2,055,767	552,069						
1826	2,622,909	446,768						
1827	3,180,767	379,841						
1828	2,437,018	488,831	10,200,102	1,612,260	16,936,307	$3,245,964	3,463,897	.....
1829	1,295,767	204,648					51.42 per cent.	
1830	663,641	92,172						
1831	5,619,353	1,287,540						
1832	2,814,879	501,502						
1833	273,631	93,957	15,904,169	2,955,115	.....	.....	5,704,067	.....
1834 (*b*)	.....	.....					55.92 per cent.	
1835	7,196,306	1,072,116						
1836	12,296,249	1,203,937						
1837	10,259,687	806,544						
1838	6,785,704	509,283	46,961,106	4,001,900	62,865,275	6,957,015	31,056,937	45,928,968
1839	7,806,254	662,306					195.28 per cent.	271.19 per cent.
1840	9,813,212	819,830						
1841	14,862,984	1,047,507						
1842 (*c*)	10,849,773	716,768						
1843	3,497,447	228,106	67,113,232	4,548,590	.....	.....	20,152,126	.....
1844	14,077,956	872,143					42.91 per cent.	
1845	23,825,072	1,684,066						
1846	16,504,879	1,112,978						
1847	8,249,207	524,874						
1848	11,379,483	862,675	72,651,360	5,361,468	139,764,592	9,910,058	5,538,128	76,699,317
1849	17,822,497	1,170,561					8.25 per cent.	122.32 per cent.
1850	18,695,294	1,690,380						
1851	32,578,193	3,836,613						
1852	17,992,646	1,876,536						
1853	21,403,925	2,625,761	110,198,202	13,165,013	.....	.....	37,546,842	.....
1854	20,033,492	2,792,558					51.68 per cent.	
1855	18,189,946	2,033,545						
1856	16,729,377	2,172,477						
1857	18,480,227	2,612,704						
1858	25,562,478	3,523,536	119,908,085	18,690,041	230,106,287	31,855,054	9,709,883	90,341,695
1859	33,030,112	5,084,562					8.81 per cent.	64.64 per cent.
1860	26,125,891	5,296,762						
1861	31,638,533	5,015,002						
1862	43,698,138	7,140,114						
1863	74,412,878	12,528,606	284,517,282	48,466,353	.....	.....	164,609,197	.....
1864	91,026,639	16,128,209					137.28 per cent.	
1865	43,741,094	7,654,422						
1866	70,435,943	10,682,257						
1867	37,683,675	5,779,511						
1868	24,582,551	3,955,671	206,032,175	31,098,856	490,549,457	79,565,209	78,485,107	260,443,170
1869	34,695,939	5,251,094					d27.59 per cent.	113.18 per cent.
1870	38,634,067	5,430,323						

a The quantities and values given are for net imports, 1822 to 1866, inclusive, and imports entered for consumption from 1867 to 1890, inclusive.
b In 1834 the exports of foreign wool exceeded the imports.
c To and including the year 1842, the fiscal year ended September 30; after that date June 30.
d Decrease.

IMPORTS OF FOREIGN WOOL, 1822 TO 1890—Continued.

YEARS.	Quantity (fiscal year). (Pounds.)	Value.	Quantity (5-year periods). (Pounds.)	Value.	Quantity (10-year periods). (Pounds.)	Value.	INCREASE IN QUANTITY AND IN PER CENT. (POUNDS.) 5 years.	10 years.
1871	50,174,056	$7,704,674						
1872	94,315,933	19,571,550						
1873	84,212,582	20,466,166	337,182,602	$69,582,888			131,150,427	
1874	56,793,737	11,611,867					63.66 per cent.	
1875	51,686,294	10,228,622						
1876	40,275,678	7,887,616						
1877	40,114,394	7,012,972						
1878	39,801,161	6,995,367	259,666,315	45,326,434	596,848,917	$114,909,322	77,516,287	106,299,490
1879	40,102,642	5,516,813					a22.99 per cent.	21.67 per cent.
1880	99,372,440	17,913,666						
1881	67,416,967	12,060,827						
1882	63,016,769	10,333,359						
1883	53,049,967	8,491,988	339,334,286	53,953,737			79,667,971	
1884	87,703,931	13,593,299					30.68 per cent.	
1885	68,146,652	9,474,264						
1886	107,910,549	13,794,213						
1887	114,404,173	16,351,370						
1888	97,271,267	14,062,100	555,629,367	77,805,485	894,963,653	131,759,222	216,295,081	298,114,736
1889	126,181,273	17,432,759					63.74 per cent.	49.95 per cent.
1890	109,902,105	16,165,043						

a Decrease.

The table shows the quantity imported by five and by ten year periods, and also the increase in quantity and the per cent of increase for both the five-year and ten-year periods over the previous periods. These percentages show remarkable fluctuations. The most rapid rate of increase in the use of foreign wool occurred in the decade ending 1840; the next greatest rate of increase occurred in the decade ending 1850, and the third in the decade ending1870. The percentage of increase in the decades ending 1880 and 1890 was small in comparison with those named.

The percentage of foreign wool entered for consumption in 1890 on the basis of net supply as estimated in the statement on page 29 is 28.50 per cent, and the average per cent for the whole series of years covered by the table is 24.06 per cent. This percentage indicates the degree to which we have succeeded in supplying the wants of the domestic manufacture from home-grown wool. But this is not a fair basis for such a comparison, inasmuch as the great bulk of our imports of wool are of class 3, called carpet wools, because used almost exclusively in the carpet manufacture and not grown, nor attempted to be grown, to any extent in the United States. The government classification of imported wools according to their blood has only been made since 1867, in which year the blood classification first appeared in the tariff. The figures for each subsequent year are as follows:

WOOLS ENTERED FOR CONSUMPTION IN THE UNITED STATES, 1867–1890, BY CLASS, QUANTITY, AND VALUE.

YEARS.	Total pounds.	NO. 1.—CLOTHING.		NO. 2.—COMBING.		NO. 3.—CARPET WOOLS.	
		Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1867	37,683,675	1,270,356	$415,609	150,302	$31,827	36,263,017	$5,332,074
1868	24,582,551	4,681,679	918,588	1,804,272	332,315	18,096,600	2,704,768
1869	34,695,940	2,512,202	505,715	4,533,367	1,092,297	27,650,371	3,653,082
1870	38,634,067	6,530,493	1,249,152	2,752,569	765,147	29,351,005	3,416,024
1871	50,174,056	5,957,461	1,201,201	17,665,600	3,167,835	26,550,995	3,335,638
1872	94,315,933	16,871,332	4,183,960	41,155,460	8,952,131	36,289,141	6,435,468
1873	84,212,582	6,029,488	1,744,200	49,540,231	12,723,501	28,642,863	5,998,465
1874	56,793,737	2,398,210	815,307	27,087,437	6,193,150	27,308,090	4,603,410
1875	51,686,294	13,117,679	3,602,535	7,769,157	2,153,261	30,799,458	4,472,826
1876	40,275,678	8,643,366	2,187,713	3,167,307	1,153,504	28,465,005	4,546,398
1877	40,114,394	9,294,029	2,202,639	2,509,954	830,715	28,310,411	3,979,617
1878	39,801,161	9,916,012	2,431,043	3,028,869	960,683	26,856,280	3,594,640
1879	40,102,642	5,229,987	1,114,301	1,709,601	413,761	33,163,054	3,988,752
1880	99,372,440	26,785,172	6,412,273	13,266,856	3,801,730	59,320,412	7,699,663
1881	67,416,967	20,609,707	4,751,454	4,421,491	1,271,332	42,385,769	6,038,041
1882	63,016,769	13,489,923	3,042,407	2,318,671	648,252	47,208,175	6,642,699
1883	53,049,967	11,546,530	2,567,443	1,373,114	343,987	40,130,323	5,580,558
1884	87,703,931	20,703,843	4,700,605	4,474,396	1,058,758	62,525,692	7,833,936
1885	68,146,652	13,472,432	2,994,533	3,891,914	921,252	50,782,306	5,558,479
1886	107,910,549	23,321,759	4,344,189	4,872,739	1,106,116	79,716,051	8,343,908
1887	114,404,173	23,195,734	4,339,498	9,703,962	2,270,058	81,504,477	9,741,814
1888	97,271,267	16,952,513	3,648,780	5,568,068	1,322,862	74,710,686	9,090,459
1889	126,181,273	22,973,088	4,764,015	6,651,719	1,556,309	96,556,466	11,112,435
1890	109,902,105	21,387,867	4,856,640	7,662,978	1,895,535	80,851,260	9,412,866

The tables show that, exclusive of carpet wools, the needs of our manufacturers have been met by the domestic clip, for the last twenty-four years, within about 23 per cent of their total consumption. This deficiency in the domestic supply consists almost wholly of qualities of the fiber which are not grown advantageously in this country.

The question of the quantity of imported carpet wools which enter into wool manufactures other than carpets may be approximately answered by these returns, but only approximately, as the imports of no fiscal year can be taken as the exact measure of the consumption of that year.

The third class wools imported were 74,710,686 pounds in 1888, 96,556,466 pounds in 1889, and 80,851,260 pounds in 1890. Undoubtedly some of the imports of each of these years are represented in the consumption of the census year, and the average of these years, which is 84,000,000 pounds, may be taken as the equivalent of the consumption of third class wools in the census year, leaving nearly 30,000,000 pounds as the consumption of first and second class wools.

The exact part of this 84,000,000 pounds of carpet wool consumed by the carpet manufacture can not be ascertained, for the reason that many carpet mills buy their yarns from yarn manufacturers, many of whom make other products, and it is impossible therefore to trace the exact disposal of the foreign wool they consumed.

The carpet manufacture spun 54,742,234 pounds of foreign wool, and used in addition 18,763,201 pounds of woolen yarn and 10,555,799 pounds of worsted yarn in the census year. The latter was made almost wholly from foreign wool, and estimating two pounds of wool to a pound of yarn, it stands for 21,111,598 pounds of wool, thus bringing the consumption of third-class wool in the carpet manufacture up to 75,853,832 pounds, or within about 8,000,000 pounds of the total consumption of this class of wool in the census year.

There was but little foreign wool used in the manufacture of the 18,763,201 pounds of woolen yarns purchased by the carpet mills. These were mostly low-grade yarns, used in cheap carpets, and in their manufacture was consumed a large portion of the shoddy, hair, and cotton consumed in the woolen mills.

The sources of the supply of carpet wools used in the American mills are shown by the following statement from the Bureau of Statistics of the Treasury Department for the year ending June 30, 1890:

QUANTITY OF WOOL OF CLASS 3 IMPORTED AT THE THREE PRINCIPAL PORTS INTO THE UNITED STATES DURING THE YEAR ENDING JUNE 30, 1890, SHOWING COUNTRY OF PRODUCTION. (*a*)

	POUNDS.		POUNDS.
Total	80,152,484	Italy	444
		Dutch West Indies	14,984
Argentine Republic	13,531,096	Portugal	339,956
Austria-Hungary	11,977	Russia on Baltic and White sea	3,397,982
Brazil	175,697	Russia on Black sea	10,594,887
Chili	1,634,953	Russia, Asiatic	204,339
China	8,704,983	Russia (not specified)	1,362,293
Danish West Indies	357	Servia	28,381
Greenland, Iceland, etc	64,104	Spain	32,837
Ecuador	1,087	Switzerland	35,685
France	2,198,996	Turkey in Europe	1,733,619
Germany	718,572	Turkey in Asia	12,474,352
England	5,193,817	Turkey in Africa	154,826
Scotland	5,144,822	Turkey (not specified)	94,023
British West Indies	32,793	Uruguay	84,569
British East Indies	6,635,751	Asia, all other	3,969,331
East Indies (not specified)	1,295,723	Country not specified	264,011
British possessions in Australasia	21,237		

a This and the following table represent imports at the three principal ports of entry only, and the total imports of Class 1 and Class 3 accordingly differ from the totals for these classes given in the table at the foot of page 31.

The imports of merino wools (Class 1 of the tariff classification) have been quite steadily increasing of late years, and the average imports since the earlier years under the tariff of 1867 have been very large. The imports of combing wools show remarkable fluctuations during the earlier years of the period, but latterly they show no tendency to increase. These imports, which consist mainly of the English combing wools, have fallen off in consequence of the perfecting of the combing machine, which permits the combing of the shorter stapled merino wools in the worsted manufacture, with better results, except in special fabrics, than can be obtained from the long English combing wools.

Of the Class I wools imported and used by our manufacturers the great bulk, 77 per cent, are of Australasian production, as is shown by the table following, compiled from the Treasury reports, which gives the quantities of Class I wools imported, directly or indirectly, from each foreign country during the fiscal year 1889–1890.

QUANTITY OF CLOTHING WOOL IMPORTED AT THE THREE PRINCIPAL PORTS INTO THE UNITED STATES DURING THE YEAR ENDING JUNE 30, 1890, SHOWING COUNTRY OF PRODUCTION.

	POUNDS.
Total	15,492,107
Australasia	11,928,921
Europe	1,271,510
England	884,807
France	262,333
Spain	91,460
Turkey	24,868
Germany	7,199
Scotland	509
Russia	334
South America	1,166,890
Chile	783,575
South America—Continued.	
Argentine Republic	168,355
Uruguay	144,239
Brazil	67,981
Peru	2,740
Africa	1,105,730
British possessions	1,102,793
All others	2,937
Asia	18,056
China	10,456
Turkey	3,800
All others	3,800
West Indies	1,000

The development of wool production in the United States, while it has been on the whole rather rapid, has not been comparable with that which has been simultaneously occurring in Australasia, South America, and the Cape colonies, and has undoubtedly been somewhat retarded by the effect of the increase in these countries upon the prices of wool everywhere.

Marked and important changes have occurred in the general characteristics of our domestic supply. The rapid increase in the supply of what are known as the "territorial" wools, grown west of the Mississippi river, generally upon ranches, somewhat after the methods pursued in Australia, has had a tendency to check the increase in the clip of the finer wools that have so long been the peculiar product and glory of the middle western states. Of the staple wools now produced in the United States, we have eminent authority for saying that they "are better adapted to the fabrication of satisfactory clothing for the American people than any other wools grown". All goods which require the medium wool are admirably supplied by domestic fleeces, which are nowhere surpassed for uniform, sound, and healthy fiber. Of the superfine wools the domestic flocks now supply little to the domestic manufacture. That these wools can be grown in certain sections of this country has been amply demonstrated, as in the superfine wools of Saxon blood which formerly brought such high reputation to Washington county, Pennsylvania. That they will not be grown, in commercial quantities, is evident from the fact that these sheep are small sized, small fleeced, and comparatively unproductive, and their fleeces can not now command prices which will render them a profitable branch of sheep husbandry. The supply of fine wools of the XX and XXX grades, for which the flocks of Ohio, Michigan, and Pennsylvania have been noted, is falling steadily behind the demand, and it is to supply this deficiency that the increasing importations of Australian wools are due. The fineness, length, and soundness of staple in these Australian wools, together with their remarkable freedom from grease, render them admirable for admixture, where high-grade goods are to be manufactured. In such goods the domestic fleece is relied upon for strength and durability, and the Australian for fineness, brightness, and beauty of finish. In the somewhat circumscribed area covering a few counties in southeastern Ohio, and contiguous sections of Pennsylvania and West Virginia, a limited number of sheep may still be found producing a wool from which goods may be made fully equal in every respect to those manufactured wholly or in part from Australian fleeces.

The specific qualities of wool which enter into the manufacture of the fabrics now chiefly made in the United States were indicated by the late John L. Hayes, in 1872, in a paper prepared for the Department of Agriculture, as follows:

Common flannels involve a very important consumption of wools, from the coarsest common or native to medium merino wools; opera flannels, from fine to very finest wools; blankets, from the most ordinary Mexican to noils (the shorter or refuse fibers obtained by the process of combing the best combing wools), up to the medium merino wools; also the shorter wools of English blood, such as the down and cheviot wools. Shawls, the principal varieties, embrace all grades of merino wool up to pick-lock; some special varieties being composed of worsted combing wools; felts, generally the lowest grades of wools, but some varieties of felting, such as piano and table covers, medium merino wool. Knit goods, such as knit shirts, vests, skirts, drawers, cardigans, hose, involve a very important consumption of wool, from the lowest to high grades of merino, certain fancy varieties, composed of worsted yarns, requiring English combing wools. Fancy cassimeres, occupying a prominent place in the list of fabrics, require all grades of merino wool, without burr, principally medium; overcoatings, such as beavers, moscows, eskimos, medium to finest grades of merino wool. For all mixtures of wool with shoddy, the best and the longest merino wools are now regarded as the most profitable, for the reason that they "carry" more of the short fiber of the wool substitute. Thin wool coatings require from medium to the finest merino wools, fancy ladies' cloakings, the finest long merino wools, and, in some varieties, mohair, or the wool of the Angora goat; gentlemen's worsted coatings, the finest long merino combing wools. For certain varieties of delaines, coburgs, and cashmeres, ladies' dress goods, with cotton warp, medium long merino wools are used; for Caledonia ladies' cloakings, a limited use is made of mixtures of fine, long combing wools and English or Canada combing wools; for serges, moreens, alpacas, Italian cloth for linings, mohair lusters, lastings, damask for furniture,

for furniture covering, curtains and table cloths, reps for furniture and curtains, webbing for reins and girths for horses and for suspenders, bunting for flags, military sashes, picture cords and tassels, clouds or nubias, Ristoria shawls, braids and bindings, long English combing or Canada wools are required; for the warp of ingrain 2 and 3 ply carpets, the long carpet wools of Cordova and Chile, unsuited by their coarseness and unequal diameter for dress goods, are employed, the short wools for filling, and for the cheaper carpets the short and coarse Mexican and Texan wools; for Brussels and tapestry, and Brussels and velvet carpets, the long Cordova and Chile carpet wools are used for the colored yarns, the warp being of linen; for the whites or very light shades, the best English or Canada combing wools.

Returning to the consideration of the total quantity of wool consumed in the wool manufacture, we have to bear in mind that camel's hair, mohair, and alpaca are regarded in the trade as the equivalents, the first of Class 3, or carpet wools, and the others of superior grades of Class 2, or combing wools. The quantity of camel's hair and noils consumed has increased from 1,583,119 pounds in 1880 to 7,684,804 pounds in 1890, and of mohair and noils from 159,678 pounds in 1880 to 2,136,244 pounds in 1890. The alpaca has been lost in the "hair of other animals", which is in the main an adulterant, and the consumption of which has increased from 6,335,169 pounds to 16,865,764 pounds.

The tables presented take no cognizance of the quantity of wool contained in the imported yarns consumed by American manufacturers, the value of which is included in the amounts reported under the head "All other materials". The quantity of woolen and worsted yarn entered for consumption in the fiscal year ending June 30, 1890 was 3,229,777.85 pounds, valued at $1,844,849.15, foreign value, an average of 57.12 cents per pound, and may be accounted the equivalent of 9,000,000 pounds of greasy wool.

Adding these items and the 373,000,000 pounds of foreign and domestic wool in condition purchased shown in the tables, together with the 25,000,000 pounds estimated by the special agent as the allowance for the scoured wool purchased, we have an approximate consumption of 434,000,000 pounds of wool in the grease. Similar additions would need to be made to the consumption reported in 1880 to institute an exact comparison and percentage of increase.

We are thus enabled to ascertain with some degree of certainty the per capita consumption of wool in the United States for a series of decades, as shown by census statistics, and by the Treasury returns of the imports of woolen goods. In estimating the amount of raw wool contained in the latter, it is customary to calculate three pounds of wool to each dollar in value of woolen goods. On this basis we make the following table:

COMPARATIVE CONSUMPTION OF WOOL IN THE UNITED STATES.

YEARS.	Imports of wool entered for consumption year ending June 30. (Pounds.) (a)	Home production of wool year ending Jan. 1. (Pounds.)	Domestic exports. (Pounds.)	Net supply. (Pounds.)	Imports of wool manufactures, allowing 3 pounds of wool to the $1 in value. (Pounds.)	Total consumption. (Pounds.)	Per capita consumption of wool. (Pounds.)
1840	b9,813,212	35,802,114	.....	45,615,326	31,095,276	76,710,602	4.49
1850	18,695,294	52,516,969	35,898	71,176,365	58,178,613	129,354,978	5.58
1861	26,125,891	60,264,913	1,055,928	85,334,876	128,497,923	213,832,799	6.80
1870	38,634,067	162,000,000	152,892	200,481,175	105,289,422	305,770,597	7.93
1880	99,372,440	232,500,000	191,551	331,680,889	95,503,641	427,184,530	8.52
1890	109,902,105	276,000,000	231,042	385,671,063	162,496,269	548,167,332	8.75

a Quantities for 1840, 1850, and 1860 are imports less re-exports. b Year ending September 30.

This per capita consumption of wool is larger than that of any other nation on the globe. The manufacturers' consumption of wool in Great Britain is slightly in excess of that in the United States, but when the exports of manufactured wool are deducted, and proper allowance is made for imported manufactures, it is discovered that the domestic consumption of wool in Great Britain is equivalent to about 262,000,000 pounds, which is a per capita consumption of 6.9 pounds. No other country approximates Great Britain and the United States in its per capita wool consumption.

COMPARISON OF THE AMERICAN AND ENGLISH WOOL MANUFACTURE.

The preceding statistics reveal a striking disparity between the consuming capacity of woolen and worsted machinery in the United States and the corresponding capacity in Great Britain. In the latter country, according to the official returns under the "factory and workshop act", there were 6,479,252 spindles (spinning and doubling) at work in the wool manufacture in 1889, consuming, as shown by the statistics of Helmuth Schwartze & Co., 428,000,000 pounds of wool, that being the quantity of foreign and home grown wool retained for consumption in the United Kingdom in that year. This was an average consumption of about 66 pounds of raw wool per spindle. In the United States 2,986,423 woolen and worsted spindles consumed raw wool to the approximate amount, as shown above, of 434,000,000 pounds in the greasy state, an average consumption of 145 pounds per spindle.

These figures are of no value for any scientific purpose, first, because they are based upon the consumption in the grease, and second, because they take no account of the other materials, such as cotton and shoddy, which pass

over the cards and are spun with the wool. They will serve to indicate in a general way the radical difference that exists in the industry as conducted in the United States and in Great Britain.

It is the same difference that appears in the cotton industries of the two countries. It has been shown that the average consumption of cotton per spindle in the United States is more than twice the average spindle consumption in Great Britain. In other words, the identical disparity of consumption, as between the two countries, exists in both the cotton and the wool manufacture. To some degree it is attributable to the same causes in both industries. These causes, as they appear in the wool manufacture, may be summarized as follows:

(1) The bulk of the yarns spun in Great Britain are of finer counts than the bulk of the yarns spun in the United States.

(2) In the United States the woolen manufacture still largely predominates over the worsted manufacture, employing 2,329,099 spindles to 657,324 spindles in the latter. A woolen spindle, from the nature of the yarn, will consume annually at least double the quantity of wool that will be consumed by a worsted spindle. In Great Britain, on the contrary, the worsted manufacture is very nearly as large as the woolen, employing 2,402,922 spinning spindles and 669,328 doubling spindles as compared with 3,107,209 spinning spindles and 299,793 doubling spindles in the woolen manufacture. These statistics of the relative number of spindles employed in the two branches of the industry in the two countries are sufficient in themselves to explain the greater average consumption per spindle in the United States.

(3) The quantity of carpets manufactured in the United States is largely in excess of the British product of carpets, and the much coarser yarn used in this branch of the industry has an important bearing upon the question and further explains the discrepancy.

(4) A fourth cause, to which some weight must be attached, lies in the fact that the domestic wool of the United States is marketed, as a rule, in a more greasy condition than the wool consumed in the British mills. There is much more of actual wool, and less of grease and dirt, in the raw material reported as the consumption of British mills than in that consumed by our own mills. This fact should also be borne in mind in considering the per capita consumption of the people of the two countries as given above.

The above explanations of this discrepancy were submitted by the special agent to Dr. Frederick H. Bowman, of Halifax, England, the well-known expert on wool fibers, and elicited from him the following response:

WEST MOUNT, HALIFAX, September 21, 1891.

S. N. D. NORTH, Esq.,
Special Agent, Eleventh Census:

DEAR SIR: In reply to your favor of the 31st August, I have myself been struck with the same anomaly which you have noticed in regard to the very much larger quantity of wool which is used in the United States in comparison with the number of spindles as compared with the consumption of wool and the number of spindles in Great Britain. I do not think there is any doubt but that the largest portion of this increased consumption arises from the very much coarser counts which are spun on the average in the United States as compared with Great Britain, and also I think in your factories there is more waste made in proportion to the quantity of yarn turned out as compared with this country. I know this is the case very markedly in your cotton mills, and I suppose the same will probably hold good in your woolen factories. When you remember there are very large numbers of mills in this country employing a larger number of spindles, where the counts probably average 60's and upward, you will easily see that a very large number of spindles are required to turn off a very small consumption of wool (and I think the main cause of the discrepancy lies here). Possibly also your statistics may not be quite so reliable as our own, and there is undoubtedly a tendency on the part of many manufacturers to exaggerate the quantity of wool which they use, with the idea of making it appear they have a large consumption off their spindles, and this may also increase the discrepancy. Otherwise, I know of no reasons why, if the same counts are spun, you should not be able to use as small a quantity of the raw material as we do in this country.

Trusting that this reply will be satisfactory,

I remain, yours, truly,

FREDERICK H. BOWMAN.

MOHAIR.

The use of mohair, the hair of the Angora goat, is of recent date and limited extent in the United States. In 1880 the use of but 159,678 pounds was reported. In 1890 the consumption had risen to 2,136,244 pounds, valued at $848,533. These figures are singularly confirmed by the commercial statistics, the McNaughtan Company, of New York, reporting the consumption for 1891 at 2,405,538 pounds and for 1890 at 2,147,019 pounds. Of the total consumption reported for 1890, the McNaughtan Company ascertained that 1,785,173 pounds were of foreign growth and 361,846 pounds domestic. Considerable attention has recently been paid to the cultivation of this fiber in the Pacific states, and the rapid increase in its use by our manufacturers will have a tendency to further stimulate the industry. The native home of the Angora goat is the mountainous districts of Asia Minor, where soil and climate are peculiarly favorable to the growth of the long, strong, and silky fiber of the Angora. The goat has been introduced into the Cape colonies, where, mixed with the native African goat, it produces a fleece which is equal to the native mohair, and large quantities of it are now annually exported to England. Dr. Bowman, the distinguished authority on animal fibers, is of opinion that its cultivation in the United States can be successfully extended in "suitable position".

The increased consumption of this fiber is due to the increased manufacture of plush and upholstery goods and other pile fabrics, velvets, astrakhans, etc., both plain and figured, for which it is now chiefly employed. Prior

to 1880 the use of this fiber had been considerably in excess of the quantity consumed in that year, due to the popularity of the hard finished luster fabrics known as alpacas, mohairs, and brilliantines, the manufacture of which was successfully undertaken by several American mills only to be followed by the complete disuse of these goods and their disappearance from popular favor. The fiber has the aspect, feel, and luster of silk, without its suppleness. It differs materially from wool in the absence of the felting quality, and its consumption for clothing purposes has been and is likely always to be limited. Because of the stiffness of the fiber it is rarely woven alone, the warp being usually of cotton, silk, or wool. Its utilization in the machine manufacture dates only from the year 1835, and the mohair of commerce is nearly all consumed by a comparatively few manufacturers.

CAMEL'S HAIR AND NOILS.

Camel's hair is coming to play an important part in the domestic wool manufacture. The total consumption increased from 1,583,119 pounds in 1880 to 7,684,804 pounds in 1890. It is only recently that camel's hair has been utilized as a textile material for machine manufacture, and up to 1885 its employment was confined chiefly to the mixture with various low stock for backing in beavers and other similar goods, and for press bagging. In that year the Abbot worsted mills, at Graniteville, Massachusetts, began the use of camel's hair as the material for worsted yarns for carpet warp, and they succeeded in making a product so strong and perfect that its introduction followed as quickly as certain difficulties in dyeing were overcome, and the increased use of the material is confined to this product. It is difficult to sort the fine downy undercoat peculiar to camel's hair from the long coarse hair which overlies it, except by the combing process.

ALPACA.

Very little alpaca is now used in the United States, and no attempt has been made to secure a return of it. The alpaca from which this fiber is obtained, is exclusively South American, and is found in the lofty ranges of the Andes, where the llama and vicugna are the most common varieties. It is especially adapted to the use of the cotton warp, and light-weight dress goods so made are among the handsomest fabrics. In the large variety of plush and upholstery goods for which the industry has become noted in this country in very recent years these fibers play an important part, which promises to increase rapidly.

WOOL IN COMBINATION WITH OTHER FIBERS.

Wool is the one textile fiber which can be advantageously used in combination with all other fibers in the manufacture of all classes of goods. It is so used to an extent which is constantly increasing in all countries, and which adds greatly to the difficulty of a proper classification of textile establishments for census purposes. In the dress goods manufacture particularly so large a proportion of the product is made upon cotton warps with a wool or worsted filling that many establishments conduct separate departments for the manufacture of cotton yarn, which is used in the products of their worsted mills. Heretofore the statistics of these cotton departments of worsted mills have been counted as a part of the worsted industry. In the present census the returns of the cotton branch of such mills have been separately secured and they are included in the statistics of the cotton manufacture, the value of the yarns made being transferred to the wool manufacture under the head of cotton yarns purchased in the tables of materials used. The mills whose returns were thus divided between the wool and the cotton manufacture were the Arlington and Pacific, at Lawrence, Massachusetts; the Lorraine Company, at Pawtucket, Rhode Island; the Hamilton Company, at Southbridge, Massachusetts; the New Albany Woolen and Cotton Company, at New Albany, Indiana; the Mississippi Mills, at Wesson, Mississippi, and all mills making simply hosiery yarns for sale to knit goods manufacturers. In no other cases was it found possible to make this separation, and all other mills using wool and cotton together have been counted as woolen mills, and properly, as wool is always the predominating material used, in value if not in quantity.

While all textile mills may be classed according to the fiber used which predominates in value, it is obvious that this classification is open to objection, and that it becomes every year a grouping more difficult to make.

Wool is not mixed with cotton to any extent in goods which are sold as cotton goods, it being a raw material of so much greater value. On the other hand, wool is used in mixture with silk, in goods where the silk effect is retained. The use of silk threads to give brilliancy and effect to patterns is increasing in the manufacture of fine worsteds, as is shown by the employment of 244,306 pounds of silk yarn and 131,529 pounds of spun silk yarn, together valued at $1,986,402. This is the first census to show the silk consumption of the wool manufacture.

Linen is used as a warp thread in certain lines of carpets, but no longer in any species of cloths, although the fabric known as "linsey-woolsey", a wool weft woven upon a linen warp (or a cotton warp) was a staple product of the household industry in the eighteenth century and earlier. The quantity of linen yarn used in the carpet manufacture in 1890 was 10,123,816 pounds, valued at $1,621,293. Jute also appears to a limited extent in the manufacture of carpets, the total number of pounds of jute yarn reported as consumed in the year 1890 being 23,795,444 pounds, valued at $1,709,461.

Some efforts have lately been made to utilize the fiber of the ramie plant, as a suitable mixture with wool, with results that are pronounced favorable; but these efforts have not yet passed beyond the experimental stage.

COTTON IN THE WOOL MANUFACTURE.

The quantity of cotton used in the wool manufacture has increased rapidly. There passed through these mills in 1890 75,428,865 pounds of cotton, valued at $8,568,149, in comparison with 48,000,857 pounds in 1880, valued at $6,253,175. Of the quantity consumed in 1890, however, 32,432,617 pounds were for use in the hosiery and knit goods industry, chiefly in merino or pure cotton stockings and underwear.

Moreover, it will appear from an examination of the summary of goods made, included under the head of "All other products" that a very large percentage of the goods made in woolen mills are purely cotton products, and, if a strict classification were possible, they would be included in the report on cotton manufacture. This is due to the fact that many mills, in their machinery equipment, are both woolen and cotton mills, and are classified as woolen mills because the preponderance of their machinery and the bulk of their products pertain to that industry. In this respect, the wool manufacture differs from the other textile industries, a difference arising primarily out of the fact that wool is a fiber that can be worked to advantage in combination with either or all of the other fibers, and is so worked, to an increasing degree and to increasing public advantage, while cotton is never combined with wool as the predominating fiber in imparting character to the fabric, outside of hosiery and knit goods, and silk only to a comparatively limited degree. The mixed textile so called is chiefly one in which wool predominates or appears to predominate. It is because of this interchangeable use of the fibers that so many woolen mills are equipped with cotton machinery.

It appears from the analysis that products valued in the neighborhood of $3,000,000 were all cotton goods, sold as such, as, for instance, cotton yarns, cottonades, cotton jeans, cotton fire hose, cotton dusters, cotton piece goods, ginghams, cotton shirting, and other similar goods which have only found their way into the products of the wool manufacture from the impossibility of separating the cotton products of a woolen mill from its woolen products, in a census return which must take cognizance of products in connection with all the other items of the schedule of inquiry.

Cotton is used in two forms in the wool manufacture: first, as the cotton warp, and second, in the making of a merino yarn, so called, in which the cotton is mixed with the wool on the carding machine and passes into the slubbing, out of which is spun a yarn for a cheap grade of goods. Undoubtedly the development of machinery has greatly increased the manufacture and consumption of these classes of goods. The quantity made in the census year is shown in Table 4 to have been 250,931,270 square yards, valued at $87,692,047, figures which indicate that it is a means of supplying a cheap grade of goods which possess many of the advantages of woolen cloths, and are a great improvement over the all-cotton goods which were largely worn in the early days of the machine manufacture.

Cotton warp woolen goods are as old as the machine manufacture of wool. The details of the wool manufacture of 1820 show that the woolen mills of that day made an almost equal use of cotton and wool in the fabrication of the cheaper grades of cloths, chiefly satinets and jeans. Its use in lighter goods for women's wear is of comparatively modern origin, and, with the exception of hosiery and knit goods, it is in this branch of the industry that the increased use of cotton has chiefly come. The manufacture of this class of fabrics first began in France, about 1833. The English adopted the manufacture at Bradford in 1834–1835, and have since surpassed all other countries in the quality and quantity of these products. The late John L. Hayes, in the official report on wool fabrics at the Philadelphia Exposition of 1876, writes that

> No event of the century has done more for female comfort and for the industry of wool than the introduction of the cotton warp. Cotton, instead of being the rival, became the most important auxiliary of wool, and has added vastly to its consumption. These fabrics are practically the same as a woolen fabric, being so covered by wool that the presence of cotton can be observed only by the closest inspection. Their cheapness and durability make their introduction an invaluable boon to women of moderate means.

In addition to the cotton used on cards and spindles in woolen mills, there were 83,624,868 pounds of cotton yarns purchased by these mills for the manufacture of the fabrics above described, and for the hosiery and knit-goods manufacture. Only a small proportion of these yarns were consumed in other branches of the industry. The cost of these yarns was $17,985,376, which, added to the $8,568,149, the cost of raw cotton, makes $26,553,525, the value of the cotton and cotton yarns consumed in the wool industry, as against a value of $98,540,484 for the foreign and domestic wool consumed.

SHODDY AND OTHER SUBSTITUTES FOR WOOL.

In treating the raw material of the wool manufacture we come next to the substitutes, so called, which are popularly grouped under the generic name of shoddy, but which are all of them, in the scientific sense, the wastes of the original raw material.

For the first time in a census the shoddy manufacture has been investigated in connection with the wool manufacture, to which it is so intimately related as to render it practically a part of the same industry. In presenting the statistics pains have been taken not to blend them, in order that there might be accurate comparisons instituted between the returns for this and other census years. The census of 1860 was the first

which took cognizance of the shoddy manufacture as a distinct and important industry. The censuses of 1860 and 1870 presented the following statistics of the industry:

GENERAL HEADS.	1860	1870
Number of establishments	30	56
Employés	290	632
Capital	$123,500	$815,950
Wages	$54,124	$198,372
Materials	$227,925	$1,098,603
Products	$402,590	$1,768,592

The volume on manufactures, census of 1880, gave a more detailed statement of the shoddy industry, and the figures there presented are shown in comparison with those of 1890 in the following table:

COMPARATIVE STATEMENT OF SHODDY MANUFACTURE: 1880 AND 1890.

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS.			Total wages.	Cost of materials used.	Value of products.
				Males above 16 years.	Females above 15 years.	Children.			
Total for United States	1880	73	$1,165,100	695	496	91	$400,326	$3,366,650	$4,989,615
	1890	94	a3,754,063	1,394	867	38	856,582	6,003,035	7,887,000
Connecticut	1880	8	96,000	93	38	8	35,345	261,200	347,500
	1890	7	395,336	154	18	8	85,816	442,852	648,060
Illinois	1880	2	22,000	16	12	3	12,300	74,500	100,000
	1890	3	110,037	41	73	.....	36,254	103,722	182,110
Maine	1880	1	6,000	4	1	3	1,905	7,200	12,000
	1890	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	1880	1	5,000	5	4	6	3,100	14,150	22,500
	1890	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts	1880	30	460,500	334	105	32	173,439	1,308,715	2,305,985
	1890	29	902,850	329	106	.....	180,748	1,170,868	1,614,459
New Hampshire	1880	3	17,300	13	8	2	5,700	38,900	49,600
	1890	3	23,000	25	.....	.....	11,683	86,816	111,848
New Jersey	1880	1	35,000	10	5	15	25,000	80,734	137,500
	1890	4	193,225	74	49	4	43,755	301,113	389,640
New York	1880	7	32,700	43	32	3	33,610	321,220	407,590
	1890	12	482,520	159	27	6	77,361	343,012	471,478
Ohio	1880	1	250,000	30	216	.....	40,600	575,000	700,000
	1890	3	744,330	191	485	20	182,700	1,100,480	1,377,500
Pennsylvania	1880	11	186,000	90	40	13	47,441	510,977	655,895
	1890	18	640,382	248	91	.....	151,175	1,205,258	1,633,770
Rhode Island	1880	6	49,600	51	26	6	18,590	137,054	195,045
	1890	10	194,250	143	3	.....	68,014	1,165,235	1,350,792
Vermont	1880	2	15,000	6	9	.....	3,896	37,000	56,000
	1890	.....	.....	.....	.....	.....	.....	.....	.....
All other states	1880	.....	.....	.....	.....	.....	.....	.....	.....
	1890	5	67,933	30	15	.....	19,076	83,679	107,343

a This amount does not include value of "Hired property".

Table 17 presents the statistics for the year 1890 more in detail. Many of the products of these shoddy mills are not shoddy as a raw material for other mills, but finished goods composed chiefly of shoddy. Nor was all the shoddy consumed in the census year produced in the mills which are classified as shoddy mills. The tables show the total production of these latter mills to have been 37,002,054 pounds, while the total consumption of the census year in the wool manufacture was 61,561,619 pounds, an increase of 18.02 per cent over the consumption of 1880. The difference, 24,559,565 pounds, was manufactured in the woolen mills consuming it.

The increase in the manufacture of shoddy, mungo, and similar substitutes, as shown by the tables, both as to quantity and value, has been somewhat in excess of the increase in the wool manufacture proper. This is a natural and expected result, for the reason that the use of these substitutes, with the success which has attended their utilization abroad, has only recently been thoroughly understood by American manufacturers. Shoddy was first successfully employed as a substitute for wool at Batley, in England, about the year 1813; but it was not until 1840 that its manufacture was so perfected that it became a considerable and a distinctly recognized branch of the industry.

In our own country these substitutes are chiefly consumed in the manufacture of yarns for low-grade carpets and knit goods, for horse blankets, and some of the cheaper grades of bed blankets, and also in cheap grades of satinets, cassimeres, and heavy overcoatings. The returns show that of the 61,561,619 pounds used in 1890 51,862,397 pounds were consumed in the woolen mills proper, and of the remainder nearly half, or 4,735,144 pounds, in the hosiery and knit goods mills. An analysis of the returns shows that a very considerable proportion of the 51,862,397 pounds ascribed to the woolen mills was utilized in the manufacture of carpet yarns, and would therefore be credited to that branch of the industry, if the conditions of the investigation permitted the subclassification. When due allowance is made for the increased use of these substitutes in carpets, it is found that the increased use of them in goods designed for wearing apparel has been no greater than the increased consumption of wool for the same purpose. The same remark applies to the increased consumption of cow's hair and other animal hairs which belong in the category of substitutes for wool.

Discussion of the question of the deterioration of the American wool manufacture, by reason of an increasing use of these various substitutes for wool, including cotton, arose in connection with the preliminary publication of these figures. For the purpose of exactly ascertaining the facts the following analyses of the tables have been prepared, showing the percentage of the several materials consumed in the years 1880 and 1890. From this table the statistics of hosiery and knit goods have necessarily been excluded, inasmuch as a large proportion of the products of these mills is purely a cotton product and makes no pretense of being anything else. The increased consumption of cotton in these goods can not therefore be regarded as an increase which displaces an equal amount of wool. The table is as follows:

QUANTITIES AND PERCENTAGES OF SCOURED WOOL OR ITS EQUIVALENTS, AND OF COTTON, SHODDY, ANIMAL HAIR, AND OTHER SO-CALLED ADULTERANTS OF WOOL, USED IN THE MANUFACTURE IN 1890 AND 1880.

MATERIALS.	1890 (Pounds.)	1880 (Pounds.)	1890 (Per cent.)	1880 (Per cent.)
Total	324,259,060	252,474,545	100.00	100.00
Scoured wool, including camels hair and mohair	207,584,746	167,634,157	64.02	66.40
Cotton	42,996,248	27,869,706	13.26	11.04
Shoddy and animal hair not specified	73,678,066	56,970,682	22.72	22.56

It will be seen that the percentage of shoddy and adulterant hairs used in 1890 is almost identical with the percentage used in 1880. The comparison shows an increase of 2.22 per cent in the relative percentage of cotton consumed (exclusive of cotton yarns purchased). This increase is not surprising in view of the great decline in the cost of cotton and the enormous increase in the domestic production of cotton warp dress goods.

In a general sense, it may be said that no substitute for wool is equal to wool itself, and any use of any other material, in the wool manufacture, may therefore be called a deterioration. On the other hand, it is true that a quality of clothing can be manufactured by their use which is warm, serviceable, and attractive in appearance, and is furnished at prices which would be impossible but for the substitutes. The consequence is that since the use of these substitutes came into vogue the masses of the people have been more healthfully and more satisfactorily clothed than formerly. There is not wool enough grown in the world to supply the needs of all the people who are dependent upon it for suitable clothing, and the fact that the per capita consumption of wool in the United States is greater than in any other country may be accepted as demonstrating that our people utilize more than their full quota of the supply. The use of substitutes has permitted wool to partially take the place of cotton to a greater or less degree in many articles of apparel, and to this extent at least it is a distinct gain and advantage. This is particularly the case in stuffs intended for women's wear. More than half the cotton used in the wool manufacture is used for cotton warp threads, in goods having a wool or worsted filling, and this class of goods has largely taken the place of cotton goods, which alone were formerly available for the wear of women of limited means.

Shoddy, in its several varieties, is simply a remanufactured fiber, possessing many of its original advantages, though of course not all of them. The fiber of wool has an extraordinary capacity of endurance. Once used it may be used over and over again, not with all its original virtues, but with its warmth-imparting qualities intact. A large proportion of the shoddy consumed in this country is simply the waste of the original manufacture, saved from the loss which befell it prior to the invention of machinery which renders it fit for spinning. In carding, spinning, and weaving certain fibers become tangled, knotted, separated from the slubbing, top, or yarn, and are thrown off. This new machinery permits this waste product to be spun again. The only point at which this material is deficient, as compared with that from which it has been thrown off, is in length of staple, and this difficulty is easily overcome by admixture with new wool.

The other varieties of shoddy are now produced by powerful machines of comparatively recent date, which pull apart the woolen or worsted rags which are fed upon it and effect a gradual untwisting of the fibers. Mungo, made from hard spun or felted cloth, is necessarily of very short fiber, by reason of the tension required

to pull it apart. Wool extract is manufactured from rags into the composition of which cotton or linen has entered, and from which the vegetable fiber is removed by carbonization, and this is the least valuable variety of these restored fibers. The value of all of them is largely dependent upon the skill with which their subsequent manufacture is conducted. Some varieties of shoddy have a value, both intrinsically and in the market, greater than that of low grades of wool. The average value of the shoddy consumed in 1890, according to the census returns, was 11.26 cents, as against an average value in 1880 of 15.42 cents. The reduction in the cost of shoddy used has therefore been somewhat greater than in the cost of wool, which is not surprising in view of the fact that the machinery for the manufacture of shoddy has been very greatly improved during the past ten years and the knowledge of its proper use greatly advanced.

DYESTUFFS AND CHEMICALS.

A very large item of expenditure in the wool manufacture is that for dyestuffs and chemicals used in the preparation of materials and the finishing of goods. The census of 1880 showed a cost of $7,648,618 for dyestuffs and chemicals, while that for 1890 shows a cost of $6,453,665 exclusive of oils and soap, which are now separately reported but which were included under the general head in 1880. The corresponding total for 1890 is, therefore, $9,146,917. Both oil and soap are important chemical agencies in the manipulation of wool in the preparatory stages of its manufacture. Of oil, 4,243,618 gallons were used, valued at $1,374,049. Much of this oil was consumed for fuel and lubricating machinery, and no distinction is made of the more expensive oils used in the preparatory processes of wool manipulation. Of the 39,290,827 pounds of soap used, value, $1,319,203, the greater portion was employed in the cleansing of material and product.

The dyeing processes for woolen and worsted goods may take place in the clean stock, in the worsted top, in the yarn, or in the piece, according to the characteristics of the fabric to be made. The fancy cassimere, the high-grade carpets, dress goods, and special fabrics of other varieties of goods are made with yarns dyed in conformity with the patterns to be woven; and in large establishments, particularly carpet mills, whose assortment of patterns is extensive, large lines of colored yarns, often over a thousand shades, are kept in stock, considerably increasing the cost of manufacture.

Wool is a better recipient of dyes than either cotton or silk, and in consequence the art of dyeing has greater possibilities in this manufacture than in any other textile industry. These possibilities have been greatly developed since the introduction of the coal-tar dyes, the increased and perfected use of which has been one of the striking advances of the past decade. The most obvious result has been the almost endless multiplication of shades of coloring in all lines of fabrics, many of them of great delicacy, which has added a marvelous variety and picturesqueness to the products of the wool manufacture. The American dyers are becoming very expert in the use of the mineral dyes, and their work now compares very favorably, in the fineness and fastness of colors, with that of their European competitors. The use of the vegetable dyes has greatly diminished during the decade; but many of our best mills still adhere to them, particularly the indigo, for their best effects.

Woolen goods receive and hold colors printed on them more readily than cotton goods, and the proportion among the light fabrics which are printed is large. The figured delaines and many of the figured worsted goods, scarfs, some descriptions of shawls, felt and woolen druggets, and the tapestry carpets, carriage robes, and many of the felt skirtings are printed. The process varies little from that employed in printing silk and cotton goods, the patterns and colors being applied either by blocks or by cylinders.

EMPLOYÉS AND WAGES.

The details of labor employed and wages paid in the wool manufacture are presented with a fullness in this census never before attempted, and are contained in Tables 11–14. These tables permit an accurate subdivision of the relative earnings of all classes, in each branch of the industry, and without the misleading results which follow from averages obtained by grouping all classes, owners and managers, clerks and operatives, skilled and unskilled, pieceworkers and time workers, in any branch.

The average number of employés in the industry during the census year was 219,132, of whom 3,163 were officers and firm members employed in productive labor or in supervision. The total employés were divided into 98,446 males above 16 years of age, 105,993 females above 15 years, and 14,693 children of both sexes. The number of males employed increased 30.46 per cent, the number of females 58.64 per cent, and the number of children decreased 23.81 per cent. The greater percentage of increase in the number of females employed shows the effect of improved machinery upon the personnel of mill operatives. The tendency of these improvements is to lessen the physical exertion required in running the machinery, and thus to increase the efficiency of female labor.

The following table indicates the percentage of men, women, and children employed in the whole industry at the censuses of 1890 and 1880:

EMPLOYÉS.	Years.	Average number of employés.	Per cent of total.
Total	1890	219,132	.....
	1880	161,557	.....
Males	1890	98,446	44.93
	1880	75,459	46.71
Females	1890	105,993	48.37
	1880	66,814	41.35
Children	1890	14,693	6.70
	1880	19,284	11.94

The decrease in the number of children employed is the most striking variation in the statistics of the two censuses. It is to be attributed largely to the enactment of laws in the several states which throw greater restrictions around the employment of children. Of these children 12,948 were employed at weekly rates and 1,745 at piece rates.

By dividing the total number of operatives employed in all branches of the industry into the total amount paid for wages we have an average of $349.84, further differentiated into an average of $461.12 for men, $273.41 for women, and $155.53 for children. In the averages thus obtained are included the salaries of officers and clerks, and also the actual earnings of pieceworkers, which are frequently found to be less than the average earnings of skilled laborers, male and female.

By a similar treatment of the wages and employés reported in 1880, we have an average of $293.33, showing an apparent increase in the average earnings of all employés of 19.26 per cent in the ten years. It is impossible to make separate averages of this description for men, women, and children employed in 1880, because the wages of each class were not then separately reported. While wages have increased in the interval the increase has not been so large as the above percentage would indicate, and we are debarred, for the above reason, from any satisfactory determination of what the actual percentage of increase has been. The much smaller percentage of children now employed affords a partial explanation of the great apparent increase in average earnings. On the other hand, the percentage of men employed has decreased from 46.71 in 1880 to 44.93 in 1890, the increase in the percentage of women employed being from 41.35 to 48.37.

One explanation of the apparently excessive increase in average earnings lies in the fact that the number of officers and clerks employed is much more closely reported in 1890 than was the case in 1880. The number in 1880 was 1,810, or one in every 89 employés. In 1890 the number is 5,273, or one in every 42 employés. The increase in the number of officers and clerks reported is 191.33 per cent, while the increase in all other classes of employés is only 33.87 per cent. If we could separate the salaries paid to officers and clerks in 1880 from the wages of all other operatives, we should be able to ascertain what the actual average increase in the earnings of the latter was. At the same time the number of officers and clerks reported in either year is so small, in comparison with the whole number, as to exert but a trivial influence upon the percentage of average earnings in either case. Neither were the conditions of the industry such in 1890 that the average time employed would be greater in this year.

AVERAGE EARNINGS.

Tables 11 and 12 give the actual average earnings for each class by itself, officers and firm members, clerks and salesmen, operatives and skilled labor, unskilled labor, and finally those employed on piecework, each class divided into males, females, and children, and each class shown both for the United States and for each separate state in each branch of the industry.

These tables are therefore the proper index of average earnings, and the only proper index. They reveal the striking disparities which exist in the wages paid in the different sections of the country, and also in the different branches of the industry. Thus, in Massachusetts, the average weekly earnings of male operatives employed in the carpet manufacture were $9.11, in New Jersey $7.70, in New York $9.58, in Pennsylvania $10.29, and in Connecticut and Rhode Island $9.16. The average earnings of females show the same disparity, running from $4.36 in New Jersey, to $7.61 in Pennsylvania. In woolen mills the average weekly earnings of males of the same class in Massachusetts were $8.63, in Pennsylvania $9.04, while female operatives in Massachusetts averaged to earn $6.42, and in Pennsylvania but $5.98. These variations in the averages are affected by varying conditions, as the varying number of hours actually employed, and are not absolute averages on that account, although they are all calculated on the basis of 50 weeks' employment during the year. Still more striking disparities, known to

be in accord with the facts, appear in the similar averages for western and southern states. Thus Georgia shows average weekly earnings for males of $6.50; of females, $3.55; Indiana, males, $7.77; females, $4.34. These illustrations might be multiplied indefinitely; and each student of the tables may pursue them through all classes, in every branch, and for every state. These general deductions are established by the analysis:

(1) That the carpet manufacture pays the highest average wages to both men and women, followed closely by the worsted manufacture.

(2) That the hosiery and knitting mills pay the lowest average wages of any branch, due to the larger number of females employed.

(3) That wages in the wool manufacture are highest in Pennsylvania.

(4) That of the New England states Maine pays the lowest average wages.

(5) That wages are considerably lower in the south than in the west, and lower in the west than in the eastern and middle states.

These deductions are sustained by another analysis of the tables given below, in which appears the actual average earnings in each of the great manufacturing states, and also in typical western and southern states, of men, women, and children separated from officers and clerks, and also from pieceworkers. It would seem that these analyses present the fairest indication of the actual earnings of the mass of the operatives for the several sections. It must be borne in mind that these are average annual earnings as contrasted with average weekly wages, and represent what was actually paid out in wages for the time employed.

SUMMARY OF AVERAGE ANNUAL EARNINGS OF OPERATIVES IN THE PRINCIPAL MANUFACTURING STATES.

(NOT INCLUDING OFFICERS, FIRM MEMBERS, CLERKS, OR PIECEWORKERS.)

STATES.	Average number of employés.	Total wages.	Average annual earnings per employé.
Maine:			
Males	3,024	$1,252,171	$407.46
Females	1,661	458,070	275.78
Children	150	22,659	151.06
New Hampshire:			
Males	3,836	1,609,269	419.52
Females	3,303	984,847	298.17
Children	225	39,424	175.22
Connecticut:			
Males	6,330	2,734,741	432.03
Females	3,676	1,141,179	310.44
Children	526	92,053	175.01
Massachusetts:			
Males	20,479	8,738,479	426.70
Females	14,186	4,176,465	294.41
Children	1,689	294,799	174.54
Rhode Island:			
Males	8,702	3,804,564	437.18
Females	6,630	2,034,310	306.83
Children	1,742	285,185	163.71
Vermont:			
Males	1,146	492,698	429.93
Females	867	274,021	316.06
Children	41	6,132	149.56
New York:			
Males	12,235	5,182,350	423.57
Females	11,512	3,230,564	280.63
Children	1,952	316,910	162.35
New Jersey:			
Males	3,098	1,282,634	414.02
Females	2,781	684,605	246.17
Children	290	49,433	170.46
Pennsylvania:			
Males	17,832	$8,130,939	$455.97
Females	16,843	4,850,354	287.97
Children	4,597	724,774	157.66
Delaware:			
Males	87	34,778	399.75
Females	37	7,365	199.05
Children	39	4,426	113.49
Ohio:			
Males	656	248,986	379.52
Females	1,113	228,582	205.37
Children	198	27,987	142.79
Illinois:			
Males	697	284,908	408.76
Females	1,299	334,710	257.67
Children	69	9,811	142.19
Indiana:			
Males	903	319,357	353.66
Females	907	181,835	200.48
Children	132	12,889	97.64
Georgia:			
Males	97	25,590	263.81
Females	166	34,734	209.24
Children	71	6,835	96.27
Kentucky:			
Males	821	271,544	330.75
Females	728	167,034	229.44
Children	178	25,105	141.04

A somewhat similar differentiation of the actual earnings of males, females, and children may be made for each branch of the industry, as appears on the following page.

AVERAGE ANNUAL EARNINGS, ALL CLASSES OF EMPLOYÉS.

(NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.)

EMPLOYÉS.	Average number of employés.	Total wages.	Average annual earnings per employé.
WOOLEN MILLS.			
Total	79,351	$28,478,931	$358.90
Males	44,485	19,369,646	435.42
Females	30,240	8,400,688	277.80
Children	4,626	708,597	153.18
WORSTED MILLS.			
Total	43,593	15,889,183	364.28
Males	19,658	9,354,463	475.86
Females	20,110	5,889,096	292.84
Children	3,825	636,624	166.44
CARPET MILLS.			
Total	29,121	11,633,116	399.48
Males	14,034	7,018,483	500.11
Females	13,682	4,251,080	324.96
Children	2,005	363,553	181.32
FELT MILLS.			
Total	2,266	$1,041,206	$459.53
Males	1,594	878,282	550.99
Females	510	135,703	266.08
Children	162	27,311	168.59
WOOL HAT MILLS.			
Total	3,592	1,363,944	379.72
Males	2,309	1,092,694	473.23
Females	1,124	252,965	225.06
Children	159	18,285	115.00
HOSIERY AND KNITTING MILLS.			
Total	61,209	18,263,272	298.38
Males	16,366	7,682,430	469.41
Females	0,927	10,049,993	245.56
Children	3,916	530,849	135.56

Rates of wages as here reported are subject in many cases to qualifications that can not be statistically shown. It is still the rule with many establishments, particularly when located in villages and smaller towns, to own tenements and houses, which are occupied by operatives at lower rents than those prevailing in the neighborhood. The boarding house for operatives, conducted by the mill proprietors and affording board at rates somewhat lower than the usual rates, still exists in connection with many mills, although it is much less frequently found than formerly.

Opportunities for overtime work are not frequent, but they sometimes occur, resulting in an increase in the average earnings, which does not appear in the tables showing weekly rates of wages.

The general conditions of labor in the wool manufacture are healthful and will compare favorably with any other industry. As a rule, the atmospheric and sanitary conditions of spinning and weaving rooms are such that the employés are subjected to no hardships from which other industries are exempt. This is particularly true of the mills of more recent construction in the New England and middle states, in which especial care has been taken to properly guard the health and comfort of the operatives. In this respect it is believed that the American woolen and worsted mills are far superior to those of any other country, and the improvement has been especially marked during the last ten years. Neither is the labor especially irksome, in comparison with that of tending machinery in other branches of manufacturing, as is shown by the general good health of the operatives employed in woolen mills. Deaths resulting from diseases in any sense peculiar to the industry, or incident to the occupation, are unknown. Accidents are not of frequent occurrence, and they are more rigidly guarded against than formerly, in consequence of the establishment of factory inspection in most of the manufacturing states and of the passage of employers' liability laws. In other respects, the lot of the operative in woolen mills has steadily improved. Until about 1870 payments were made at irregular intervals, according to the convenience of employers, sometimes monthly, sometimes quarterly; now, as a rule, they are made weekly in the eastern and middle states. All payments are now made in cash, except in a few western mills, the use of store orders having been generally abandoned since the war.

Prior to 1850 it was customary to begin work in all woolen mills as soon as it was light and to work as late as the light would allow, with no fixed regular hours. In the short days, for about six months in the year, it was customary to work until 9 in the evening, taking half an hour each for breakfast, dinner, and supper, 12 hours of work being the rule, summer and winter. For many years later the breakfast was a meal taken after an hour or more of work. About 1855, 11 hours began to be the general day's work, and this continued in most states until about 1875, when the 10-hour system came into use.

All the great manufacturing states now have ten-hour laws, differing in details in some instances, but virtually the same in their effect, with reference to the employment of women and children, which control the hours in which the machinery can be kept in operation to advantage. Since this census was taken Massachusetts has reduced the working hours of women and children by statute from 60 to 58 hours per week.

PERCENTAGE OF LABOR COST TO TOTAL COST OF MANUFACTURE.

The relation of labor cost to the total cost of manufacture can not be determined from these tables. Such a percentage is apparently secured by the simple process of adding all the items of cost and ascertaining the percentage of the total which was paid out for labor. The percentage thus obtained for this industry is 25.64; but it is not a true percentage as appears from the fact that the sum paid out for partly manufactured products, such as yarns, is a sum increased by the amount of the labor cost of manufacturing those yarns; and this labor cost has been counted but once, in the labor column, while the value of the materials has been counted twice, once as wool or cotton in the raw state and once as yarns. In other words, the methods of census compilations are such as to render it impossible to obtain from the figures a true percentage of labor cost as compared with the whole cost of manufacture. Such a percentage of labor cost, if ascertainable, would have little significance, for the reason that it is an exceedingly variable element and fluctuates in every variety of goods manufactured according to the value of the stock employed or the fineness and finish of the goods manufactured. A cheap satinet, made of low-priced stock, will for that reason show a comparatively high percentage of labor cost, while a fine worsted cloth, manufactured from costly wool, may show a percentage of labor cost no greater than that of the satinet, although the actual labor cost to manufacture a yard of the latter is double or treble the labor cost in a yard of satinet.

THE PRODUCTS OF WOOL MANUFACTURE.

The wool manufacture differs from every other textile industry in the almost endless variety of its specific products and their ever changing characteristics. It is broadly divided into six grand groups or classes, some of which have little in common with others beyond the fact that they utilize the same raw material. These six grand groups or classes are: (1) the woolen manufacture proper, (2) the worsted manufacture proper, (3) carpets, (4) felt manufactures, (5) wool hats, and (6) hosiery and knit goods. A seventh class might be added to include the shoddy manufacture, the statistics of which are here given. Each of these grand divisions is subdivided into a great variety of products, which again have little kinship with each other.

Still again, there is another class of products manufactured from wool, commonly called "small wares" in the trade, and for which there is no equivalent term in any language, the French word "passementerie" being much too limited in its significance to cover the case. The felting property of wool renders it useful in a thousand different forms which have no relationship whatever to clothing, such as materials for sheathing roofs and vessels, nonconducting envelopes for steam boilers and pipes, gun wads, polishing wheels, hammers for piano keys, and the like. Wool is manufactured in combination with all other fibers, with asbestos and India rubber, and is also utilized in the manufacture of an endless variety of braids, gimps, gorings, and similar appurtenances, which it is impossible to separately classify.

These characteristics of the industry render the grouping of its products extremely difficult for purposes of census classification. The trade names by which certain fabrics are known at one census period may stand for goods essentially different at another. For this reason these trade classifications or designations have been dropped, except as to the well-defined groups of staple goods, and a new one has been adopted, based primarily upon the composition of fabrics. This new classification furnishes a clearer conception of the nature of the industry and its products. It also supplies a more accurate basis of comparison for future census inquiries.

Only a general comparison of the products of the wool manufacture in 1880 and 1890 can be made. This was inevitable, even had the classification of 1880 been adhered to, so great have been the changes in the nature of fabrics in the interval.

Direct comparison is impossible for another reason. The products of the mills were reported at the census of 1880 in running yards; they varied in width from one-half to one and one-half yards and over, according to the nature and use of the fabric. An aggregate based upon such a variable unit of width would have been meaningless, and hence none was attempted at the census of 1880. The returns of piece goods for the present census were all reduced to square yards, and are so reported in the tables. Thus a definite knowledge of the quantity of product is secured, and an accurate basis for comparisons at future censuses obtained.

Each of the six classes of manufacture was separately reported in 1880, and is now again separately reported; so that the relative growth of each, as measured by value of products, is indicated by the tables.

CLASSIFICATION OF PRODUCTS.

In each class the use of other raw materials than wool is common to the manufacture in all countries. This is particularly true of woolen and worsted goods, the two groups in which are included nearly all the fabrics which enter into the clothing of the people. In these two groups the basis of primary classification adopted was as follows:

(1) All wool fabrics.

(2) Fabrics of cotton warp with wool filling.

(3) Fabrics composed either in warp or filling, or both, of wool, cotton, or shoddy combined, commonly known as union or merino goods.

This classification of products is as essential to a full understanding of the industry in these branches as the division into woolen goods made of carded materials, and worsted goods made of materials that have passed through the combing machine. The subdivision of the product into the different varieties of fabrics for men's and women's wear is further indicated in the tables with as close a classification as possible.

Analysis of the tables now submitted shows a total of 381,004,461 square yards of goods turned out by the woolen and worsted mills whose operations are covered by this report, subdivided as follows:

PRODUCTS.	Square yards.	Value.
Total	381,004,461	$169,409,239
All-wool goods	130,115,152	81,742,586
Cotton-warp goods	194,566,427	63,361,687
Union goods	56,322,882	24,304,966

A complete summary of all products, according to a classification contained in the schedule of inquiry and based on commercial use, is presented in the following table:

PRODUCTS.	Quantities.	Value.
Woolen, worsted, union, and cotton warp cloths, coatings, cassimeres, etc., for men's wear ..... square yards..	104,938,311	$83,523,714
Woolen, worsted, union, and cotton warp overcoatings, cloakings, etc., for men's and women's wear. square yards	14,883,893	13,082,801
Woolen, worsted, union, and cotton warp dress goods, sackings, tricots, ladies' cloth and broadcloth, alpacas, mohairs, etc., for women's wear ..... square yards..	126,692,829	32,149,923
All-wool, union, and cotton warp flannels ..... do....	61,195,501	18,582,549
Satinets ..... do....	18,630,656	4,296,082
Linings, Italian cloths, and lastings ..... do....	4,585,080	1,255,520
Jeans, kerseys, and linseys ..... do....	17,126,217	4,738,034
Jersey cloth ..... do....	3,072,533	2,171,328
Buntings ..... do....	566,880	135,983
Carriage cloths ..... do....	1,282,921	626,791
Total piece goods ..... do....	352,974,821	160,562,725
Woven shawls of wool or worsted ..... do....	4,758,652	2,098,523
All-wool, union, and cotton warp blankets ..... do....	20,793,644	7,153,900
All-wool, union, and cotton warp horse blankets.... do....	5,507,074	1,721,516
Carriage robes ..... do....	775,963	646,904
Total ..... do....	31,835,333	11,620,843
Woolen, worsted, and union upholstery goods. square yards.	4,131,288	3,634,133
Braids and picture cords ..... running yards..	133,859,751	
Ingrain carpets, 2 and 3 ply, and ingrain art carpets ..... square yards..	36,726,370	15,924,452
Tapestry and body brussels, tapestry velvet, Wilton, Axminster, and Moquette carpets ..... running yards..	36,536,565	27,125,980
All other carpets ..... square yards....	1,521,330	784,204
Rugs of all kinds ..... number..	1,563,803	2,629,781
Total value of carpets and rugs	.....	46,464,417
Felts ..... square yards..	6,950,001	3,120,293
Wool hats ..... dozens..	1,046,481	5,229,176
All wool and union or merino yarns ..... pounds..	42,215,173	13,062,970
Worsted yarns ..... do....	29,376,182	22,411,365
Cotton yarn ..... do....	3,692,936	782,849
Wool rolls, noils, waste, and all other partly manufactured products ..... do....	12,850,039	3,176,653
Total yarns and partly manufactured products	88,134,330	39,433,835
Woolen, merino, and cotton half hose ..... dozens..	7,080,943	7,441,852
Woolen, merino, and cotton hose ..... do....	10,072,033	11,749,438
Merino, all-wool, and cotton shirts and drawers .... do....	6,866,157	33,009,997
Leggings and gaiters ..... do....	25,072	85,401
Gloves and mittens ..... do....	898,081	1,942,030
Hoods, scarfs, nubias, etc ..... do....	342,497	1,476,430
Cardigan jackets, etc ..... do....	361,478	3,576,248
Knit shawls ..... do....	22,990	115,467
Fancy knit goods, wristers, etc ..... do....	270,633	759,748
Boot and shoe linings ..... yards..	7,596,711	1,088,558
Total	.....	61,245,169
All other products	.....	6,457,933
Total value of products	.....	337,768,524

The total value of all the products of the wool industry in 1890 is shown by these tables to be $337,768,524, exclusive of the products of shoddy mills and plants operated in penal, reformatory, and eleemosynary institutions.

GROSS AND NET VALUES.

The above value of products is accurately compiled as it appears upon the schedules returned by the manufacturers: but it is a gross value, i. e., the value at the mills of all the marketable products of those mills, whether wholly or partially manufactured, as previously explained in this report, page 21.

In the wool manufacture the chief item of duplication is the purchased yarns, and care has been taken to keep this item so separated from others that the net value of the wool manufactures of the country can be readily ascertained. Thus the value of woolen and worsted yarns purchased in 1890 was $34,631,025, and of this sum after subtracting the duty paid value of foreign yarns imported, $3,114,930), $31,516,095, is duplicated in the column of gross value of product, and must be deducted from that total value, leaving the net value at $[illegible]. The increase in the net value of products is 21.17 per cent as compared with an increase of [illegible] per cent in gross value.

Inasmuch as the statistics of the shoddy manufacture are not included in the gross value of the products of wool mills, the total gross products of the wool manufacture should be increased by the sum of $1,975,781 (from which is to be deducted the value of woolen yarn purchased, $4,000), the value of the completed fabrics manufactured in the shoddy mills, making the total gross value of woolen products $339,740,305, and the total net value $[illegible].

Previous censuses of the wool manufacture have failed to call attention to this duplication of products and the distinction between gross and net value of products. The same duplication occurred in all of them, and the necessity thus exists for making all the comparisons of this report on the basis of the gross value.

Prior to the census of 1870 no account was taken of yarns purchased. In the census of that year purchased yarns were reported by quantities only, values being omitted. Net values are thus only obtainable for the censuses of 1880 and 1890. In the former year 24,078,253 pounds of woolen and worsted yarns were purchased, having a value of $15,769,016, which amount, less the value of yarns imported in 1880 (635,755 pounds, valued at $1,262,489), subtracted from the gross value of products reported, $267,252,913, leaves a net value of $252,746,386 for the products of the manufacture in 1880.

The total quantities of yarns purchased in 1890, 1880, and 1870, including yarns made in other textile mills, and therefore not duplicated in the gross values of this report, are shown in the following tables, the second of which gives the comparative amount of these purchased yarns used in each branch of the industry at each period:

YARNS PURCHASED—COMPARATIVE SUMMARY.

Years.	Total pounds of yarn.	Value.
1890	a178,858,121	$58,467,726
1880	68,393,298	26,484,683
1870	23,524,911	Not given.

a This includes mohair, silk, jute, and linen. Without these the amount would be 143,824,249 pounds, valued at $52,616,401.

YARNS PURCHASED IN 1890.

YARNS.	TOTAL.		WOOLEN MILLS.		WORSTED MILLS.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	178,858,121	$58,467,726	32,175,910	$12,007,406	22,307,298	$15,347,357
Woolen	31,385,664	11,285,379	4,982,919	3,000,984	903,174	355,592
Worsted	28,813,717	23,345,646	2,560,619	2,540,667	11,551,264	11,811,625
Cotton	83,624,868	17,985,376	23,990,406	5,239,928	9,454,874	2,441,972
Mohair	738,777	534,169	324,181	297,995	232,071	212,364
Silk	244,306	1,395,176	120,571	632,545	46,138	344,556
Spun silk	131,529	591,226	69,358	281,211	19,427	127,775
Jute	23,795,444	1,709,461	125,327	13,181	.....	.....
Linen	10,123,816	1,621,293	2,529	895	100,350	50,473

YARNS.	CARPET MILLS.		FELT MILLS.		WOOL HAT MILLS.		HOSIERY AND KNITTING MILLS.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value
Total	80,811,257	$14,760,639	10,241	$2,019	350,000	$24,982	43,203,415	$16,325,323
Woolen	18,763,201	4,112,324	.....	.....	350,000	24,982	6,386,370	3,791,497
Worsted	10,555,799	4,711,249	.....	.....	.....	.....	4,146,035	4,279,105
Cotton	17,920,498	2,712,484	10,241	2,019	.....	.....	32,248,849	7,588,973
Mohair	182,400	23,712	.....	.....	.....	.....	125	98
Silk	.....	.....	.....	.....	.....	.....	77,597	418,075
Spun silk	.....	.....	.....	.....	.....	.....	42,744	182,240
Jute	23,670,117	1,696,280	.....	.....	.....	.....	.....	.....
Linen	9,719,242	1,504,590	.....	.....	.....	.....	301,695	65,335

Another differentiation in the industry is in the separate establishments for dyeing and finishing woolen goods. The added value imparted to product by the finishing processes of these separate establishments must be added to the figures above given to obtain a true net value. From the report on Dyeing and Finishing Textiles is obtained the following summary of these added values in wool, yarns, woolen and worsted goods, and mixed textiles:

DYEING AND FINISHING.

MATERIALS.	Quantity.	Added value.
Total		$4 017,366
Woolen yarns, dyed (pounds)	17,999,651	751,801
Worsted yarns, dyed (pounds)	9,342,157	493,974
Wool stock dyed (pounds)	1,160,666	48,828
Wool and worsted piece goods dyed (square yards)	20,779,034	652,998
Mixed textile piece goods dyed (square yards)	60,716,250	2,069,765

THE REDUCTION IN MARKET VALUES.

No exact method exists whereby the relative quantities of goods represented by the total values of products reported in 1880 and 1890 can be ascertained. The constant variations which occur in the characteristics of fabrics, and the corresponding variations in the quality and value of the raw materials utilized for their manufacture, destroy any general standards of comparison. Careful investigation of price lists covering the whole period between 1880 and 1890 determines that the fall in the value of manufactured products during that period has borne the natural relation to the fall in the value of the raw materials of which they are composed. The following table gives the average cost per scoured pound of foreign and domestic wool utilized in the wool manufacture and in each of its branches, as shown in the censuses of 1890 and 1880, and also the percentage of decrease:

AVERAGE COST OF SCOURED WOOL CONSUMED IN THE WOOL MANUFACTURE, AND IN EACH CLASS, 1890 AND 1880.

MILLS.	Quantity. (Pounds scoured.)	Cost.	Average cost per pound. (Cents.)	Per cent of decrease.
Total:				
1890	214,945,513	$98,540,484	45.84	19.34
1880	171,880,831	97,681,604	56.83	.....
Woolen mills:				
1890	100,226,094	48,859,811	48.75	20.60
1880	109,724,213	67,380,250	61.40	.....
Worsted mills:				
1890	54,989,746	28,280,287	51.43	11.10
1880	26,334,635	15,235,878	57.85	.....
Felt mills:				
1890	4,213,230	1,841,382	43.70	26.48
1880	2,733,796	1,624,871	59.44	.....
Wool hat mills:				
1890	3,018,114	1,448,799	48.00	34.69
1880	3,597,279	2,644,293	73.50	.....
Carpet mills:				
1890	35,726,837	9,855,787	27.59	6.79
1880	23,563,216	6,975,129	29.60	.....
Hosiery and knitting mills:				
1890	16,771,492	8,254,418	49.22	23.64
1880	5,927,692	3,821,183	64.46	.....
Quantity of wool "in condition purchased":				
1890	372,797,413	98,540,484	0.26	21.21
1880	296,192,229	97,681,604	0.33	.....

These average values appear abnormally low when compared with the prices of scoured wools given in current market quotations. But it is to be borne in mind that the latter quotations relate to the standard grades of wools. The enormous quantities of inferior and "unmerchantable" wools in every year's clip possess a scoured value much less than the average above indicated. The average value of the total clip of the United States in 1890, in the condition marketed, is estimated at about 26 cents in commercial quarters, and this estimate permits a shrinkage of 49 per cent to reach the average value of scoured domestic and foreign wools shown at this census. The relative

average prices as between 1880 and 1890 correspond closely with the general decline in the value of wool in the ten years, as indicated in current market quotations.

An average decline in the cost of scoured wool of 19 per cent may be assumed to mean a somewhat smaller decline in the cost of the manufactured goods. The materials constitute about one-half the cost of the manufactured goods on the average. There has been an increase in the rates of wages in this industry during the decade, but not corresponding with the fall in the cost of raw materials. On the other hand, there has been a cheapening of the cost of manufacturing through the greater efficiency of improved machinery, but not sufficient to offset these increased wages. The balancing of these shifting elements in cost results in the conclusion that the reduced cost of production in the decade is from 8 to 10 per cent, which reduced cost represents the reduction in values. Any temporary advantage which comes to manufacturers from a fall in the cost of raw materials must almost immediately be yielded in their own prices, so close has become competition in all lines of standard goods. Reckoning the fall in the value of goods as 8 per cent in the decade, the value of the products of 1890 would have been $367,139,700, on the basis of values which obtained in 1880.

NOMENCLATURE.

The fundamental terms by which the distinct fabrics of the wool manufacture are designated are simple and well defined as to their meaning, are of universal application, and are used throughout this report in their commonly accepted significance.

Other forms of nomenclature have been for the most part discarded, as tending to confuse. They are innumerable in number, and are the result of the ingenuity of manufacturers who, having devised some new style or design of fabric, seek to distinguish it in the market by affixing a novel and distinguishing name. Hundreds of such names have thus been introduced into the speech of the manufacturer, most of which disappear with the fabric to which they are applied. Other names, used to describe some radical departure from ordinary fabrics, remain and become fixtures in the nomenclature of the trade, but often with an ultimate significance different from that originally attaching to them. These names rarely have any etymological signification and are constantly reappearing in different connections.

The fundamental distinctions between different fabrics are due primarily to the method of spinning the yarns, whether woolen or worsted, and secondarily, to the weaves employed in fabrication. The primary difference in classification is subsequently explained. The classification by weave applies to the system of harnesses by which the loom is equipped for different tissues. There are four fundamental weaves, from which all other simple fabric are variations:

(1) The plain weave, which is the simplest fabric, in which but two harnesses are employed, forming a simple interlacement of the threads of the warp and weft. This is the weave of broadcloth, cotton shirtings and sheetings, and mousselines de laine. (2) The twilled weave, produced by three or more harnesses. (3) The satin weave, produced by five or more harnesses, the effect of which is to bring the threads of either the warp or the weft prominently to the face. (4) The gauze or leno weave. Different effects are produced from derivatives and combinations of these fundamental tissues. Thus, in the most simple, that of cloth or plain weave, varied effects are produced by the greater or less torsion of the threads, and the direction in which they are twisted; by variations in the size of the warp or weft compared with each other; by making the weft pass alternately over two threads and one thread of the warp, making a "rep" or corded tissue, etc. Still other variations are made by the use of different materials in the warp or weft by making them of pure wool and of a single color, or mixed with silk, mohair, etc. The four fundamental interlacements, which form the base of the most complicated tissues, are further varied by combinations of crossings of the threads which occur at variable places at each course of the thread across the web, forming figured, brocade, or damasked effects, which are produced by the jacquard loom. Another variation is made by having two warps, one to form the ground of the tissue and the other made to pass over wires to form a loop, making velvet or pile fabrics.

CLASS 1—WOOLEN GOODS.

The primary group of wool manufactures, that which was first to take root in the United States, and is most intimately associated with the domestic economy of the people, is that which is called woolen goods proper, and which includes all carded wool woven fabrics, from the homespun cloth to the broadcloth, the fancy cassimere, the flannel, the blanket, etc.

The status of this branch of the manufacture at each census period since 1840 is shown in the following table:

STATISTICS OF WOOLEN MILLS: 1840–1890.

YEARS.	Number of establishments.	Capital.	Miscellaneous expenses.	Average number of employés.	Total wages.	Cost of materials used.	Value of products.
1840	1,420	$15,765,124	.....	21,342	.....	.....	$20,696,999
1850	1,559	28,118,650	.....	39,252	.....	$25,755,991	43,207,545
1860	1,260	30,862,654	.....	41,360	$9,610,254	36,586,287	61,894,986
1870	2,891	98,824,531	.....	80,053	26,877,575	96,432,601	155,405,358
1880	1,990	96,095,564	.....	86,504	25,836,392	100,845,611	160,606,721
1890	1,311	a130,969,940	$8,402,623	79,351	28,478,921	82,270,335	133,577,977

a This amount does not include the value of "Hired property".

The most striking fact brought out by the returns for 1890 is the decline in the market value of the products of woolen mills as compared with 1880. These products are now returned at a value of $133,577,977, and in 1880 they reached $160,606,721, a decrease of 16.83 per cent.

This decline is the result of the change from the woolen to the worsted fabric, a change forced upon the industry by the requirements of popular taste. The production of worsted mills has enormously increased, the growth being equal to 136.05 per cent. These goods have taken the place of the carded wool fabrics, which up to thirty years ago constituted the entire production of men's-wear goods in the United States.

The quantity of raw materials consumed in woolen mills was greater in 1890 than in 1880, being 200,543,253 pounds in the former year, as against 186,868,828 pounds in 1880, an increase of 13,674,425 pounds, or 7.32 per cent, as shown by the following table:

MATERIALS USED.	1890 (Pounds.)	1880 (Pounds.)
Total	200,543,253	186,868,828
Scoured wool (domestic and foreign)	100,226,094	109,724,213
Camel's hair and noils	1,781,240	1,234,064
Mohair and noils	60,533	84,080
All other animal hair	9,619,277	4,497,524
Cotton purchased	36,993,712	24,744,964
Shoddy	51,862,397	46,583,983

It follows that the quantity of products in this branch of industry was greater than in 1880, notwithstanding the decrease in value.

This analysis of the raw materials consumed in this branch of the industry demonstrates a slight deterioration in the average quality of products. While the quantity of scoured wool consumed decreased by over 9,000,000 pounds, the consumption of shoddy, cotton, and miscellaneous animal hair increased 22,648,915 pounds.

A large part of these substitutes or adulterants were consumed, not in the manufacture of cloths, but in low grade yarns for cheap carpets, in cotton products, and in horse blankets, in all of which there was a great increase of product in woolen mills.

Nevertheless it is true that the competition with worsted goods has compelled the woolen manufacture proper to cater more directly to the demand for cheaper grades of clothing material, so that the change in the character of materials used, shown above, is natural and explained by the peculiar conditions surrounding this industry. The demand for a cheap fabric exists and steadily increases, and it can only be met by the partial use of materials cheaper than wool.

WOOLEN CLOTHS.

The great branch of the woolen manufacture proper is the production of cloths for men's wear. The production of cloths of this description aggregated 112,225,297 square yards, valued at $60,258,252. In their general characteristics these cloths have changed very slightly since the beginning of the industry in the United States. There are some exceptions to this rule which are worthy of note. At the beginning of factory manufacture the woolen cloths consisted almost wholly of plain cloths, known as broadcloths; plain twilled fabrics similar in face to broadcloths, known as cassimeres and kerseymeres, and satinets. Several of the earlier mills brought the manufacture of broadcloths to a high degree of perfection. Samples are still in existence of blue and black broadcloths made at the Vassalboro mill in Maine, in 1853, from selected Silesian wool, costing, with duties and charges, about $3 a pound, and woven with 120 picks to the inch, which were conceded by experts from various countries to equal in fineness and finish the best products of the West of England mills, which had occupied in all international expositions the position of pre-eminence. It was thus made evident that in this particular fabric,

which is substantially the same to-day as when first made in the French convents four centuries ago, and which for that reason is regarded as the typical product of the industry, can be manufactured in the United States with as high degree of perfection as anywhere else, the economic conditions being equal. (*a*)

The diminution of the American broadcloth manufacture has been commonly traced to the tariff of 1828, which imposed a duty upon the fine imported Saxony wools out of which the fine grades were made, equal to the duty on the goods themselves. The decline dates from that period; but it has been greatly influenced or accelerated by other causes; the constantly diminishing domestic supply of superfine wools, the Saxon wool culture, for which there was such a craze for the fifteen years following the tariff of 1824, having long since disappeared; and the change in the popular taste, which has practically destroyed the market for broadcloths. With the introduction of fancy goods the demand for broadcloths ceased, except for special purposes. A similar although not equal diminution has occurred in the fine cloth manufacture of other countries.

SATINETS.

From the broadcloth, which represents one extreme of wool manufacture, we turn to the satinet, which is typical of the other extreme, and equally a product of the earliest American woolen mills. The total quantity of satinets produced in 1890 was 18,630,656 square yards (usually three-fourths of a yard in width), valued at $4,296,082, or an average value per square yard of 23.06 cents, or 17.29 cents per running yard. This was an increase from 16,629,116 running yards in 1880 (value not then given) to 24,840,875 running yards in 1890. The values here indicated are evidence enough that there is an abundance of cheap clothing in the United States. In the earlier part of the century the cheapest cloths having any claim to be called woolen cloths could not be made in factories for three times this cost. As a consequence the people were at that time more largely clothed in all-cotton garments than is the case to-day. But the satinet of those early days was an entirely different fabric from the present satinet, the relative cheapness having been brought about by changes in processes, and by the knowledge of how to use cheaper materials to advantage. The early satinet was a cloth made on a cotton warp with a filling spun from the ordinary grades of domestic fleeces, the waste of which was practically lost. It is that waste, combined with other renovated wastes, cotton, etc., which now constitutes the filling of the satinet. The original satinet was a plain cloth, made of dyed yarns. The present satinet is a printed fabric, in which, by the use of fast colors, an effect is obtained similar to that of the fancy cassimere. These goods will not retain the appearance nor endure the wear of all-wool goods. But in proportion to their cost they answer their purpose quite as well. Although the figures given indicate a marked increase in production, this class of goods has suffered severely of late from the competition of the cheaper grades of fancy cassimeres, and more particularly from the transient popularity of cheviot goods, so called, which are rough, openly woven woolen goods, made in black or mixed colors from coarse wool. The relative quantity of satinets manufactured is to-day much smaller than before the war.

JEANS.

Another group of goods belonging to this category is jeans, which differs from the satinet chiefly in that it is a plain fabric with a twilled weave. The quantity produced was 17,126,217 square yards, having a value of $4,738,034, which shows a somewhat higher average of value than the satinets. These goods are largely made in the west, where there are a number of mills which devote their entire machinery to turning out supplies of these goods to meet the western and southern demand for a cheap, substantial, every-day fabric.

FANCY CASSIMERES.

The predominating group of the woolen manufacture is next in order of consideration, and is the largest in the quantity and value of its products, although one of recent development. These cloths in all their varieties are commonly grouped under the name of fancy cassimeres. Their manufacture dates from the year 1836, and they have worked a practical revolution in the industry as previously conducted. In 1834, a certain M. Bonjèan, a wool manufacturer of Sedan, France, devised a modification of the plain cloths hitherto universally made, by uniting upon the same stuff different tints or patterns of tissue, by the use of the jacquard loom. The goods were susceptible of as many varieties of pattern or style as the fancy might dictate, and at once became immensely popular, not only in France, but in all manufacturing nations. The beginning of their manufacture in this country is traced to Mr. Samuel Lawrence, then the agent of the Middlesex mills, at Lowell, Massachusetts, and Mr. George Crompton, the inventor of the Crompton loom. Mr. Lawrence had seen specimens of the goods, and he applied to

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a Thaddeus Clapp, of Pittsfield, Massachusetts, wrote in 1877 as follows: "The first broadcloth made in this country was by Scholfield in 1804. The cloth was a gray mixed, and when finished was shown to the different merchants and offered for sale, but could find no purchasers in the village. A few weeks subsequently Josiah Bissell, a leading merchant in town, made a voyage to New York for the purpose of buying goods, and brought home two pieces of Scholfield's cloths, which were purchased for the foreign article. Scholfield was sent for to test the quality, and soon exhibited to the merchant his private marks on the same cloth which he had before rejected. In 1808 Scholfield manufactured thirteen yards of black broadcloth, which were presented to James Madison, from which his inaugural suit was made. Five merino sheep were introduced about this time in this town, and Scholfield was able to select enough to make this single piece, and President Madison was the first President who was inaugurated in American broadcloth."

Mr. Crompton to test the feasibility of constructing a loom for their manufacture, on a pattern already successfully applied in cotton fabrics. In 1840 Mr. Crompton succeeded in adapting his cotton loom to the manufacture of fancy woolens, and it was put in operation in the Middlesex mills. Up to this time no fancy woolens of any description had been woven in the United States, and here were made the first fancy cassimeres woven by power anywhere in the world. For many years afterward the hand loom continued to be solely employed for these goods in France and all foreign countries; and their manufacture, by power, progressed more rapidly here than anywhere else, although the industrial conditions at that time existing made the development exceedingly slow, as is shown by the fact that the whole amount received under the license to manufacture the loom given by Mr. Crompton to Phelps & Bickford, of Worcester, Massachusetts, was only $14,000 during the fourteen year term of the patent on his loom.

The new cloths were adapted to the change which had begun in our domestic wool supply. They required soundness, length, and strength of fiber, rather than the softness and fineness which had been formerly striven for in our fleeces. In the production of this class of goods many American mills gradually secured a degree of excellence which gave them a reputation beyond the limits of our own country, and at the Philadelphia Exposition of 1876 samples of domestic goods were exhibited which were favorably compared with the products of Sedan and Elbeuf in France, which centers have earned the reputation of surpassing the rest of the world in novelty of design and perfection of execution.

FLANNELS.

Important among the products of this branch of the industry, and one of the earliest and most stable, is the flannel of every variety. The flannel manufacture reached considerable dimensions under the household system of industry; and under factory methods no other fabric has been made in such quantities or used for so many purposes. It has attained an enormous development in the United States, not equaled in any other country, and for a period of more than forty years it has been enabled, except in some exceptional fancy varieties, to exclude the foreign article from the home market, an achievement equaled only in the manufacture of blankets and of bunting, and perhaps carpets. The primary cause of the successes of the flannel manufacture in the United States was assigned by John L. Hayes to "the peculiar adaptation of the American wools for this fabric". This adaptation consists in their spinning qualities, their soundness and elasticity, and their medium fineness, producing the requisite softness, without too much felting quality to cause an undue shrinking of the goods.

To this it may be added that flannel being the first stage in the manufacture of plain cloth, and from its simple character requiring a comparatively small labor expenditure, it has naturally received a great degree of attention from American manufacturers on account of the steady domestic demand for the goods. Its uses are multiform and continue to increase. The rigor of our climate created an enormous demand for flannels for underwear, a demand which has of late years been met by knitted underwear goods. As the latter have gradually superseded flannel for undergarments other uses for flannels have increased, and to-day they are in great demand for children's garments, fatigue uniforms for soldiers and policemen, and summer wear of every description.

It is a matter of record that as early as 1821 flannels were made in the state of New York by the predecessor of the present Stott mills that were pronounced equal to the best Welsh flannels. Another record is that the Groveland mill, in Massachusetts, founded in 1804 by Ezekiel Hale, made 30,000 pieces of flannel in 1823; and, in 1827, three mills in the neighborhood of Newburyport, Massachusetts, manufactured goods of this description valued at $700,000.

Of late years the American manufacture of carded wool dress goods, which are simply fancy flannels, has grown to be a distinct and creditable branch of the manufacture, and in beauty, delicacy, variety, and fastness of coloring the industry has attained a degree of perfection nowhere excelled.

The American flannel manufacturers have secured and retained the control of their home market by studying to adapt their products to the peculiar wants of our own people. In this way they have given them certain characteristics which foreign flannels do not possess. In 1835 the "Domett flannel", an original fabric, composed of a cotton warp with a filling of wool, came into use as a substitute for the linsey-woolsey stuffs, originally of household manufacture, and worn by working women for under petticoats. It shrinks but little in washing, and has persistently held its own in the interval as a characteristic domestic product. The red flannels have still a large consumption among working people, especially frontiersmen and lumbermen. About 1859 first appeared the blue flannel coating, wool-dyed, and having a three-leaved twill. This fabric, which is sheared and finished like cloth, but which nevertheless retains the lightness and pliability of the flannel cloth, is also distinctively American in origin and character.

Opera flannels, a name applied abroad to a light flannel more highly gigged and finished than the ordinary flannel, which is piece-dyed uniformly in fancy colors and hot pressed, were first introduced in this country by the Bay State mills, and their manufacture was continued at Ware, Massachusetts, by the late George H. Gilbert, about 1858, in which year he made and sold 4,000 pieces. In 1871 the same establishment made and sold 120,000 pieces of these goods, equivalent to 2,000,000 yards, and the foreign importations had by this time entirely ceased.

Still higher grades of all-wool gauze and silk-warped flannels are successfully made in this country. Flannels were exhibited at the Philadelphia Exposition having 130 picks to the inch, in which the filling yarns were spun to a length of 46,500 yards to the pound and the warps to a length of 34,500 yards.

Another variety of flannel for which the domestic manufacture is distinguished is known as the French plaid, largely used for shirts and children's garments. The present fashion has immensely stimulated the production of these goods, which are made in every variety of pattern and in every form of mixture with cotton and silk.

Of the production of the census year, 61,195,501 square yards, of the value of $18,582,549, are classified as flannels proper, and 52,785,570 square yards, value $15,821,087, as woolen dress goods, which are the fancy flannels above alluded to. We have from the two items combined an aggregate quantity of 113,981,071 square yards, which is almost equal to the quantity of cloths manufactured in woolen mills. The product of woolen dress goods above indicated may be contrasted with the 73,907,259 square yards of worsted dress goods made in the census year to determine the relative popularity of the two varieties of fabrics for women's wear.

BLANKETS.

The next group of woolen fabrics in importance is composed of blankets, which have been classified as house blankets, of which 20,793,644 square yards were manufactured, valued at $7,153,900, and horse blankets, of which 5,507,074 square yards were manufactured, valued at $1,721,516.

By the census of 1880 blankets were reported by pairs to the number of 4,000,000, including horse blankets, of value of $6,840,000, and varying in value from 60 cents to $6 per blanket, the average value per blanket being $1.71. (*a*) The increase in the blanket manufacture is greater than would appear from the difference in the value of the product on account of the excessive fall in values witnessed in this branch of the industry.

The blanket manufacture of the United States will not suffer by comparison with that of any other country, and it has long completely supplied the domestic market. The energies of the manufacturers are largely directed toward the production of the coarse and medium qualities for which there is steady demand. The competition has been so close and the product so even with the demand, if not in excess of it, that there have been many years since the close of the civil war in which the product has found a market without profit to the manufacturer. The stimulation of war prices, the large requirements of the government for the army and navy, and the exclusive possession of the home market had tempted an undue proportion of the smaller mills of the country into the blanket manufacture. They largely continued in it after the war closed, until in 1878 the glut of production became so great that the larger manufacturers found it necessary to relieve the market by an auction sale in New York. At this, the largest sale of woolen fabrics which had occurred in this country, 6,000 cases of blankets, averaging 50 pairs to a case, were sold for $717,940, at an estimated loss of $100,000 on the first cost of the goods. From the first the blanket industry has been subject to vicissitudes. Repeated efforts to establish it successfully in the earlier history of the industry were costly failures. After the tariff of 1842 went into effect the manufacture developed very rapidly until the tariff of 1846, which placed a duty of 30 per cent upon imported wools, while reducing the duty on flannels and blankets to 20 and 25 per cent. After 1857 the blanket manufacture again advanced so rapidly that by 1861 nearly the entire consumption of the country was of domestic production, as it has since continued to be.

Certain high grades of blankets, which originated with the Mission mills of California in 1858, have attained a world wide celebrity for weight, thickness, softness, and perfection of face. Advances have been made in the blanket manufacture in the last ten years in the lighter weights of finer finish. Jacquard borders of two and three colors are now a feature that adds greatly to the appearance of the goods. Many famous mills have been identified with the blanket manufacture of the United States, including older mills which long since disappeared.

SHAWLS.

The manufacture of woolen shawls was at one time an important branch of the industry, but changes in fashion have greatly reduced the output of these goods. There were 4,458,483 square yards of woolen shawls manufactured in 1880, valued at $1,955,214. These shawls were of a great variety of sizes and of qualities, and the statistics indicate nothing as to their average value beyond the fact that the bulk of the product was in cheap grades. Neither is it possible to make any comparison with the shawl production of 1880; for shawls were then returned, not in square yards, but in number, viz, 1,242,979, and no value was given. It is probable that the production did not greatly vary at the two periods.

The manufacture of all-wool plaid shawls, formerly known in this country as the "Bay State shawl", from the mill which introduced it, first assumed importance about the year 1848. Similar shawls had been made many years earlier, notably at the Watervliet mills, West Troy, New York, but upon hand looms, and the product was limited. From 1850 to the close of the civil war a number of larger mills were employed upon these goods, some of them exclusively. Prominent among these mills were the Peacedale, Watervliet, Waterloo, Middlesex, and Washington, formerly the Bay State.

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a Bulletin of the National Association of Wool Manufacturers.

The early application of the cassimere twill to this fabric, the facility with which the design is made and varied through the alternate concurrence of the warp and filling, and the ready adaptation of the medium American wools to this product, caused the domestic manufacture of woolen shawls to reach proportions, in the day of its prime, of which no adequate picture is presented by the statistics either of 1880 or 1890. The decline of this branch of the industry was hastened, not only by the popular preference for cloakings as an outside covering, but also by the introduction of the process of dyeing worsted yarns with fast colors, which led to the substitution of worsted shawls, of which there were made 300,169 square yards in 1890.

No serious attempts have been made in this country to produce the highest qualities of shawls. It is not possible, under present conditions, for machine made shawls to compete with the hand productions of the East.

CLASS II—WORSTED GOODS.

A striking feature of these statistics is the development of the worsted manufacture. It may be described in general terms as a treatment of wool after the methods of the cotton manufacture. The worsted manufacture is more complicated and expensive than the woolen manufacture, requiring more machinery of a most costly character and more skill and care in manipulation. The woolen yarn carded and spun on the mule, with few intermediate manipulations, is composed of a loose thread of tangled fibers, interlocking and criss-crossing irregularly, and lacking in tensile strength. The worsted yarn is composed of fibers of wool running parallel with each other, closely twisted into a strand which is smooth, hard, and comparatively strong. This difference between the two yarns is effected by the introduction of the combing machine and gill box, and doubling spindle mechanisms. The function of the combing machine is to lay the fibers of the wool parallel with each other, eliminating the short fibers or noils, all of which are retained in the woolen yarn. The whole process is thus fundamentally different from that of making woolen yarn. Vickerman describes worsted spinning as a series of processes continuously following each other, while woolen spinning is a compound process intermittently carried on. The worsted yarn is perfected by drafting on a series of spindles, and may be spun to a fineness of 33,600 yards, 44,800 yards, and 56,000 yards to the pound, although worsted yarns of such high numbers are rarely made in the United States.

Woven from yarns so fundamentally different, the woolen and worsted fabrics require treatment equally different in the finish, and they are easily distinguished from each other. The one is woven loose and open and is thoroughly fulled. The absence of felting from the worsted constitutes the final difference between a worsted and a woolen cloth. In the former the surface is hard and the characteristics of the weave are distinctly visible.

The worsted manufacture is of very ancient origin in England and France, but it was wholly unknown in the mills of this country until about the middle of the present century. That our wool manufacture should have been so long confined to the woolen form is one of many evidences of the primitive character of the manufacture here as compared with Europe. Very early in the century worsteds had become popular in Europe, and before our first worsted mill was constructed the manufacture nearly equaled that of woolens both in England and France.

The first attempt at the manufacture of worsted in the United States was at a mill in Ballardvale, Massachusetts, in 1843. The manufacture of delaines was here undertaken by John Marland, employing about thirty looms. The experiment extended to delaines for printing, in which the block process was used, and also to goods dyed in the piece. All the wool was combed by hand. The enterprise was not regarded as successful, largely, perhaps, because of the limited means of its projectors.

The Amoskeag mills, at Manchester, New Hampshire, was the second establishment to attempt this manufacture, and it persevered for about seven years. In 1845 the Manchester mills, in New Hampshire, built a large mill for the manufacture of delaines. At first this company used carded wool only. Their first combing machines were introduced about 1855, very shortly after they had superseded the hand comber in England. The wools used were a high grade of Ohio and Pennsylvania merino. The Manchester mills printed their own delaines from the start. All delaines had previously been printed by hand by what was known as the block machine, a slow and expensive process. At Manchester the so called Birch machine was used for a time, but the use of the cylinder for printing calicoes almost immediately suggested the similar method of printing delaines now universally in use. The original delaines made by this company were goods averaging about seven yards to the pound, and the popularity of the fabric may be inferred from the fact that the Manchester mills for years made delaines of the value of $1,000,000 per annum. The fashions changed about 1868, but printed worsteds of a somewhat lighter weight are still made at these and other mills.

The success of these pioneers brought other mills into the field. The Hamilton Woolen Company, at Southbridge, Massachusetts, soon afterward converted their mill from a woolen cloth factory into a dress goods mill, and in 1853 the Pacific mill, at Lawrence, was organized for the manufacture of the same class of fabrics. This mill also began by using carded yarn, but in 1854 it imported six combing machines of the Lister pattern, which are believed to be the first set up in this country. The Washington mills afterward followed, and made the first all-wool worsted dress goods manufactured in America.

The census of 1860 took cognizance of but three worsted mills as then in existence in the United States, the Manchester, Pacific, and Hamilton. The development of the industry from that date until the present time is shown in the following table:

STATISTICS OF WORSTED MILLS: 1860–1890.

YEARS.	Number of establishments.	Capital.	Miscellaneous expenses.	Average number of employés.	Total wages.	Cost of materials used.	Value of products.
1860	3	$3,230,000	.....	2,378	$543,684	$2,442,775	$3,701,378
1870	102	10,085,778	.....	12,920	4,368,857	14,308,198	22,090,331
1880	76	20,374,043	.....	18,803	5,683,027	22,013,628	33,549,942
1890	143	a 68,085,116	$4,917,760	43,593	15,890,183	50,706 769	79,194,652

a This amount does not include value of "Hired property".

The American manufacture of worsteds received its great impetus under the operation of the reciprocity treaty with Canada, whose sheep were wholly of English blood, producing the long combing wools peculiar to those breeds, of which there were in 1860 but few grown in the United States. Of the 6,000,000 pounds of this long wool grown in Canada at that period about 4,000,000 pounds were exported to the United States, where they were converted into a great variety of fabrics then extremely popular for female wear, and just beginning to be manufactured in quantities: alpacas, brilliantines, poplins, grenadines, and similar goods to which fancy names were attached with almost every change in contexture and pattern. The same period witnessed the successful beginnings of American efforts in the manufacture of furniture goods, moreens, damasks, reps, mohairs, braids, and other goods of this class. Great improvements in combing machinery during this period stimulated these industries. The transient popularity of fabrics of alpaca, hard and lustrous, was met by the American discovery that by the use of cotton warps with a filling of combing wool an excellent substitute for alpaca could be had.

Even at this time, however, the longer stapled merino wools, from 2.5 to 3 inches in length, were being combed for making delaines and similar fabrics. Other changes and improvements in combing machinery came into use, the fashion for bright goods waned, the development of the worsted suiting industry came on, and it supplied itself with combing wools of merino blood. The reign of the long combing fleeces was over, and they began to fall in value as rapidly as they had risen. The effect of these mutations in the industry upon that class of wools may be judged from the London quotations of Lincoln wool, which fell from 25.75 pence in 1865, a price which it reached again in 1872, to 10 pence in 1890.

Between 1860 and 1870 the number of establishments manufacturing worsted goods increased from 3 to 102, the capital from $3,230,000 to $10,085,778, the operatives from 2,378 to 12,920, and the value of products from $3,701,378 to $22,090,331. The decade from 1870 to 1880 showed the number of worsted manufactories reduced to 76, but the amount of capital employed doubled, and the market value of the products increased from $22,090,331 to $33,549,942.

The decade now under consideration shows a ratio of gain greater than any other. The number of mills just about doubled, the capital increased more than three times, the total number of employés more than doubled, and the value of the products increased 136.05 per cent. While the relative importance of the worsted industry in this country is not yet as great as in either England or France, it is nevertheless clear that this is the department of wool manufacture for which the future holds the greatest promise.

DRESS GOODS FOR WOMEN'S WEAR.

The sketch above given indicates that the worsted manufacture was confined for many years to the making of the light-weight goods for female wear, commonly grouped under the name of "stuffs" or dress goods, except as to the manufacture of coarser worsted yarns for use in the carpet industry. All the products of this general class are grouped under this one head as the only practicable classification where there exists such a multitude of names and varieties of fabrics. The census of 1890 shows the manufacture of 73,907,259 square yards of goods of this general character, having a total value of $16,328,836. The quantity of running yards manufactured in 1880 was 75,109,225. An increase in quantity occurred, as the great bulk of the dress goods are manufactured in narrow widths, running from 26 up to 54 inches, but averaging perhaps somewhere between 30 and 40 inches. The increase in the manufacture of suitings for men's wear has, however, been much greater, both in value and quantity.

One explanation of this fact is found in the enormous quantities of dress goods imported into this country of late years. The following table, prepared from the Treasury Department reports, shows approximately the quantity of this class of imported goods consumed by the American people since 1867:

IMPORTS OF DRESS GOODS ENTERED FOR CONSUMPTION: 1867–1890.

[Goods weighing over 4 ounces per square yard estimated at 4.5 ounces to the square yard.]

YEARS.	Square yards.	Foreign value.	YEARS.	Square yards.	Foreign value.
1867	68,845,745	$20,356,635	1879	54,982,153	$14,365,255
1868	67,035,850	16,868,362	1880	67,986,246	16,752,068
1869	68,941,611	18,280,490	1881	61,990,172	15,961,066
1870	68,417,235	18,044,982	1882	93,772,856	19,070,817
1871	80,857,310	21,651,423	1883	93,920,152	22,619,106
1872	81,213,343	24,071,832	1884	63,831,494	15,349,097
1873	75,696,005	23,119,442	1885	61,491,520	14,197,987
1874	73,489,162	22,363,759	1886	67,346,150	14,971,277
1875	77,926,496	22,330,018	1887	76,871,189	17,199,141
1876	60,234,205	16,555,100	1888	85,504,490	18,742,493
1877	52,912,741	14,111,843	1889	93,261,526	19,793,253
1878	53,902,154	14,164,130	1890	107,915,289	22,668,293

When to the quantity given for 1890 in this table we add the 73,907,259 square yards of domestic manufacture, we have the enormous total of 181,822,548 square yards. Of the imports above given the great bulk were of so called worsted dress goods (but including linings and Italian cloths, by reason of the tariff classification). Adding to the above total the carded wool dress goods manufactured in the United States we again increase our total to 234,608,118 square yards of material manufactured at home and abroad for the clothing of American women.

These statistics show that the imported supply of worsted dress goods and linings is considerably in excess of the domestic manufacture, which is true of no other branch of the wool manufacture. This class of goods constituted in 1889 about 37 per cent of the total imports of woolen goods of every class and description. The foreign value of these imported dress goods in 1890 was $22,668,293, and their duty-paid value was $39,159,241, as against a value of $15,821,087 of domestic wool dress goods, $16,328,836 of domestic worsted goods, and $1,255,520 of domestic Italian cloths, linings, etc., the total value of the kindred domestic productions being $33,405,443, showing that the duty paid value of the import of these goods exceeded the mill value of the domestic production of similar goods by the sum of $5,753,798.

The imports of dress goods are separately classified as part wool or cotton warp goods and all-wool goods. The average foreign value of the cotton warp dress goods imported in 1890 was 20 cents per square yard, their duty paid value 33 cents. The average foreign value of the all-wool dress goods imported was 20 cents per square yard, and their average duty paid value 38 cents per square yard. The average value at the mill of the domestic products in worsted dress goods in 1890 was 22 cents, which maintains a striking relationship to the average foreign value of the imported competing goods, and is 16 cents less than the average duty paid value of these goods. The American manufacturers have of late years practically supplied the home market for the cheaper grades of mixed dress goods. The importations of these grades consist largely of novelties, in the production of which the Bradford manufacturers are particularly expert.

The further analysis of the domestic production of worsted dress goods divides them into 11,349,319 square yards of all-wool goods, valued at $3,905,398, an average value per square yard of 34.41 cents; and 62,557,940 square yards of cotton warp or mixed dress goods, valued at $12,423,438, an average value of 19.86 cents per square yard. It is clear, therefore, that the domestic production of all-wool dress goods does not yet equal one-sixth of the average annual consumption of the American people.

But even this proportion indicates a very decided gain, which was almost wholly secured within the decade between 1880 and 1890. It was not until a few years ago that our manufacturers ventured to attempt this manufacture, except experimentally, the trial usually demonstrating the impossibility of competing to advantage with the French in a field which they have made peculiarly their own and in which they meet with only desultory competition from the manufacturers of other European nations. The products of their mills are recognized throughout the world as inimitable, so far as artistic pattern and dyeing are concerned, and exhibit a perfection of finish which stamps them as the most perfect fabrics in the whole range of the textile industry.

In entering this field American manufacturers have had to contend with the strong popular prejudice in favor of the French goods, and with the problem of reconciling prices with much greater labor cost. The proportion of labor cost increases in an inverse ratio as the size of the yarn becomes finer. Thus the operative who can spin 60 pounds a day of the yarns known as 40's is reduced in his production to say 30 pounds when spinning 60's, and to 15 pounds if he spins 80's. The capacity of the machinery is reduced in the same manner. That is to say, there will be twice as many yards of yarn to a pound for 40's as for 20's, and as each yard has more turns of twist

per inch in 40's than in 20's the production per frame in pounds is much smaller for 40's than for 20's. Considerations of this character are of prime importance in determining the question whether we are likely to succeed in domesticating the important industry of fine all-wool dress goods. In the meanwhile the census of 1890 shows remarkable progress in this direction, a progress which has since become even more marked. The goods of this description made by several of our leading worsted mills reveal a taste in their conception and a care and delicacy in their finish which permits them to sell in the markets side by side with the French stuffs.

WORSTED GOODS FOR MEN'S WEAR.

This report has thus far spoken only of the history and statistics of the worsted manufactures of the United States in their relation to the lighter fabrics adapted to women's wear. The development of the other branch did not begin until more than twenty years later, but so rapid has been its progress that in 1890 the value of its products was nearly double the value of the products of the dress goods mills.

There is some confusion as to the exact time and place when and where this manufacture began in the United States. Mr. John L. Hayes is authority for the statement that the first merino worsted coatings made in the United States were turned out by the Washington mills in 1870, under the inspiration of the late E. R. Mudge, who had been a United States commissioner to the Paris Exposition of 1867, and had been much impressed with specimens of these goods of French origin there exhibited. On the other hand, it is equally certain that similar fabrics were made at the same time by the Hockanum Company, at Rockville, Connecticut, and the Wauskuck mills in Rhode Island also commenced the manufacture of worsteds about 1870.

Mr. Henry G. Kittredge, the editor of the Boston Journal of Commerce, writes as follows on this point:

> From the treasurer's annual report to the Washington mills' stockholders, December 24, 1868, we learn that in 1864 two combing machines, with necessary preparing and spinning machinery, were purchased for making worsted yarns. With this machinery the mills experimented on various fabrics with more or less success until 1868, when, in the words of the report, "an article of very general utility was perfected" for which new worsted machinery was bought, also looms of new and improved construction for the manufacture of goods which had been before wholly imported, thus diversifying the product of the mills and adding one more and a very important branch to American industry. We have indisputable evidence that about the middle of 1869 light weight (12 oz.) worsteds were being manufactured in quantity, made from 2-60 yarn for warp and filling. It was not till the latter part of 1870, or the early part of 1871, that heavy weights were begun to be manufactured by these mills.

It was many years before our manufacturers began to seriously compete with foreigners in this class of goods. The expensive machinery required to manufacture the yarns employed was one obstacle in the way of a more rapid development, and another was the tariff discrimination in the act of 1883 against this class of goods. The tariff of that year, like all previous tariffs, was apparently arranged on the theory that the worsted manufacture was confined to "stuff" goods, so called, for women's wear, to which it was wholly limited prior to 1870. Worsted cloths were entered at rates of duty so much lower than those applied to cloths made of carded wool that the domestic market was chiefly supplied from foreign mills. The development of the worsted industry was retarded by these conditions; but the popularity of these fabrics increased so rapidly that many mills adapted their machinery to its production. The former fancy cassimere makers especially were ready to adopt a fabric which was well adapted to their looms and required but little change in their machinery beyond the substitution of combs for cards. But in most cases they purchased their worsted yarns from the great combing and spinning establishments which sprang up. The making of worsted cloths thus practically became an adjunct, not of the original worsted industry, but of the woolen cloth manufacture.

It is worthy of note that the first important movement toward the specialization of the wool manufacture in this country, after the method which distinguishes it in France and England, dates from the introduction of the worsted cloth manufacture, and about the year 1870. Up to that period the worsted manufacture had been chiefly carried on in mills possessing all the appurtenances necessary to turn out the completed product from the raw wool to the finished goods. It is true there existed a few mills prior to this date engaged solely in yarn spinning, and particularly carpet, zephyr, and hosiery yarns. But the real development of worsted spinning as a separate industry has occurred since 1870.

The quantity of worsted cloths of all descriptions produced during the census year was 28,469,887 square yards, valued at $32,299,578, as compared with 5,726,994 running yards produced in 1880, and reported in the census of that year under the heads of coatings, suitings, and overcoatings among the products of both worsted and woolen mills. These figures show how enormous has been the increase in the consumption of this class of goods. The quantity is still, however, much smaller than the production of woolen cloths for similar wear, which was 127,109,190 square yards.

BUNTING.

Up to the close of the civil war all the bunting used in the United States was manufactured in England, where it was made of the long combing wools peculiar to that country. In 1865 the United States Bunting Company was organized at Lowell, Massachusetts, and at once successfully achieved the manufacture of this important fabric; and this establishment, together with the New England Bunting Company, located in the same city, now supply practically all of this material used in the United States. They have shown great skill, not only in the manufacture of the materials of which our national flags are made, but also in the construction of the flags themselves.

The total quantity of bunting made in 1890 was 566,880 square yards, valued at $135,983. Practically the whole of this production was used for flags.

The census of 1880 reported 2,230,221 running yards of bunting manufactured in worsted mills in that year and 355,000 running yards manufactured in woolen mills. In explanation of these larger figures it may be said that at the time the census of 1880 was taken a material known as bunting was very popular as a wearing apparel for women, and the great bulk of the product reported was used for that purpose. The fashion then in vogue no longer obtains, or, if there is still a limited quantity of the fabric made for this purpose, it is now included in the worsted dress-goods products of 1890.

WORSTED BRAIDS.

The manufacture of worsted braids in this country was successfully established in 1861, at Pawtucket, Rhode Island, by the late Darius Goff, who began with six braiding machines. Experimental efforts had preceded Mr. Goff's venture, but his was the first establishment to persist in the enterprise until it was crowned with success. The machines for braiding in use in this and other mills were of American invention, made expressly for the purpose, and they were great improvements over those then employed in England, being much simpler and requiring about half the power to operate them.

The quantity of braids and braiding is reported in running yards. The quantity and value of these goods, the location of the establishments making them, and the number of braiding machines employed are shown in the following table:

STATES.	Number of establishments.	Yards.	Value.	Number of braiders.
Total	11	104,205,251	$1,264,622	.....
Massachusetts	2	20,085,888	266,001	2,400
New York	3	26,537,240	338,000	4,300
Rhode Island	5	40,856,750	545,249	4,050
Pennsylvania	1	16,725,373	115,372	.....

In 1880, braids were reported by dozens of pieces to the number of 2,612,691 dozens. The increase in the production has been enormous in the ten years, and the domestic market is practically supplied by the home product.

PLUSHES AND PILE FABRICS.

An important branch of the worsted manufacture, the manufacture of mohair plushes and other similar pile fabrics for upholstery purposes, has been successfully established in this country since the census of 1880 was taken. Three mills were equipped for this specialty very nearly contemporaneously about 1882, that of the Tingue Manufacturing Company, at Seymour, Connecticut; D. Goff & Sons, at Pawtucket, Rhode Island, and the Goodell Brothers, of the Sanford Mills, in Maine, who established the manufacture of plush carriage robes and velours in this country in 1867. Great embarrassments attended the establishment of the upholstery plush manufacture in this country on account of the difficulty in obtaining the proper weaving machinery. The manufacture of mohair plushes was confined at that time to France and Germany, where the peculiar looms employed were kept under the closest surveillance. Repeated attempts to procure this machinery abroad were baffled, and the result was the invention of American patterns, of which different mechanisms were evolved by each of the establishments named. Mr. Goff's loom, originally based upon an English patent, was finally, after five years of experiment, perfected on an entirely novel plan, and these looms now produce a fabric in every way equal to the best plushes made abroad, and with much greater economy of labor. The product of these and other mills is now sufficient to practically supply the domestic market, which is very large, not less than 3,500 railway cars being annually upholstered with their goods.

The success of the experiment in plush manufacturing has been followed by an extraordinary development in the production of a great variety of pile fabrics and kindred goods for upholstery and house decoration purposes. The artistic element has had ample field for play in these products, and the evidences of originality and the power to create striking effects which are shown in many of these goods have brought the American textile manufacture suddenly and favorably into the notice of the world. This has been particularly the case in what are known as chenille goods, largely used for household decoration. Cotton is the fiber chiefly used in these goods, and with a few exceptions they have been returned to the census under that branch of manufacture. Silk and worsted are used to a large extent in the making of the higher grades of these fabrics, and the manufacture has grown so rapidly since 1880 that it may hereafter be properly recognized as a distinct branch of the textiles, to be separately treated, and one which holds out the highest promise and opportunity for the future.

CLASS III—CARPETS.

The manufacture of carpets is regarded as the most characteristic branch of the textile industries of the United States. Two causes have contributed to the unique development of this branch of the wool manufacture. One was the extraordinary contribution of American invention to the mechanism of carpet manufacture, exceeding in value and importance those of all other nations combined. Another is the general prosperity of our people and the high wages earned, permitting families in all grades of life to indulge in the luxury of floor coverings, and creating a large and lucrative market.

In this respect mechanical manufacturing has effected a great change in the comfort and habits of our people. Up to the middle of the last century a carpet was a curiosity even in the homes of the wealthy. Such as existed were chiefly of the variety known as rag carpets, made then as now in the family. The first carpet manufactory of whose existence in this country there is any record was established in Philadelphia in 1791 by William Peter Sprague. The census of 1820 reported small quantities of wool carpeting woven by hand at Newport, Rhode Island, in Queens county, New York, and in Frederick county, Maryland, but this was presumably rag carpeting. In 1825, Alexander Wright, a native of Scotland, started a small carpet mill at Medway, Massachusetts, which he operated for a time with hand looms brought from Scotland. After passing through several hands the mill and machinery were sold in 1825 to the Lowell Manufacturing Company, then recently organized for the manufacture of carpets and cotton goods, and when the Lowell mill was completed the machinery was removed to that city. The origin of that great establishment is thus definitely fixed. Very shortly the Lowell Company was running 70 carpet looms, and producing weekly 2,500 yards of ingrain, brussels, and other carpeting, and 150 rugs. The census of 1860 records that in 1830 a manufactory of imitation brussels and ingrain carpets was started at Carlisle, Pennsylvania; that in 1833 there were three carpet mills in operation in Columbia county, New York, and large mills at New Haven, Connecticut, and Norwich, Connecticut, and that by 1834 there were in operation at least 511 hand carpet looms in from 18 to 20 mills. Upon these looms were made annually 21,600 yards of brussels, 31,500 yards of 3-ply ingrain, 954,000 yards of other ingrain, 132,000 yards of venetian, and 8,400 yards of damask venetian, a total of 1,147,500 yards, having an average value of $1 a yard. This production has since multiplied more than 70 times. At the same time many families were supplying themselves with rag carpeting made at home, and the quantity of rag carpets made in the household for sale was much greater than at present.

Mr. Hayes wrote that it was within his personal recollection that at about the same time the manufacture of ingrain carpets was undertaken at Great Falls, in New Hampshire, by power, the apparatus for making the figure automatically being a large cylinder or drum, upon which pins or blocks were placed corresponding to the pattern to be woven, the cylinder operating like that of a music box. This apparatus was also used at Little Falls, in New Jersey. This, as well as other automatic devices elsewhere tried, was finally abandoned, as operating less favorably than the hand loom. In 1844 the hand loom, both in Europe and this country, was universally used for making carpets.

The real development of our carpet industry dates from the successful application of power to the carpet loom, as the result of experiments and inventions made by Erastus B. Bigelow, of Boston, Massachusetts. Many improvements had in the meanwhile been made in the hand loom, and several patents were issued to manufacturing American inventors. Up to the time when Mr. Bigelow succeeded in making the carpet loom automatic the English machinery was superior to our own, and the jealousy with which it was guarded made it impossible for American manufacturers to equal the carpets then imported from England in much larger quantities, relatively, than has since been the case.

In co-operation with Mr. George W. Lyman, treasurer of the Lowell Company, who supplied the funds, Mr. Bigelow worked out the device he had conceived, and by 1844 the successful weaving of ingrain carpets by power had been achieved at Lowell. From that point the history of the ingrain carpet manufacture in this country has been a record of constantly extending development. The Hartford Carpet Company, next to the Lowell the earliest organized of our large carpet manufactories, at once adopted Mr. Bigelow's invention under arrangements with the patentees, and other establishments followed suit.

Mr. Bigelow next devoted his energies to the invention of power looms for weaving jacquard brussels and wilton carpets. The results of his labors being offered to the Lowell Company and not accepted, Mr. Bigelow established a factory of his own at Clinton, Massachusetts, which was organized into the Bigelow Carpet Company in 1854, and became the largest establishment in the world, uniting under one management all the processes of spinning, dyeing, and weaving jacquard brussels, and wilton carpets. The supplemental report of the jury at the London Exposition of 1851 declared that the specimens of these classes of carpets exhibited by Mr. Bigelow were "better and more perfectly woven than any hand loom carpets that had ever come under the notice of the jury". This, however, was but a small part of their merit, or rather that of Mr. Bigelow, "who has completely triumphed over the numerous obstacles that presented themselves, and succeeded in substituting steam power for manual labor in the manufacture of five frame brussels carpets".

English manufacturers were quick to appreciate the importance of this invention, and an arrangement was made by Crossley & Sons for placing the new looms in their immense establishment at Halifax. Subsequently

this company purchased Mr. Bigelow's patent rights for the whole of the United Kingdom. The right to use his patents was sold to a few mills in the United States, and until their expiration the manufacture of these particular carpets was confined to these mills.

Still another of Mr. Bigelow's inventions was for weaving tapestry carpets, so called. This style of carpet, known both as tapestry brussels and tapestry velvet, of comparatively recent invention, is now extensively manufactured both in England and the United States. It is particularly adapted to meet the demand for brilliant effects at popular prices; for there is no form of carpet where so handsome an appearance can be secured at so low a cost. In all other carpets the yarns are dyed, and the process of arranging these many colored yarns for the loom, to work out an elaborate pattern, is slow and expensive. In the tapestry carpet the colors are printed upon the warp threads in such a manner that when the warps are woven they form the desired figure. The room for the application of color and design is therefore unlimited. This method of printing the warps, originally invented by a Scotchman about 1832, was perfected by John Crossley, of Halifax, in 1842. It was first undertaken in this country by John Johnson, at Newark, New Jersey, in 1846, with 25 hand looms. This establishment was subsequently removed to Roxbury, Massachusetts, where the inventive genius of Michael M. Simpson brought the manufacture to the highest state of efficiency. A number of our largest carpet mills are now employed in the manufacture of tapestries. The progress made in this manufacture is attested by certain records kept by the Roxbury Company. The product of the first hand looms was but 5 yards per loom per day. In 1856 the product of each power loom in these mills was 16 yards. In 1876 the average product of each of 114 looms was 49.5 yards per day, and this average has since been slightly increased.

The American manufacture of Axminster carpets, the most luxurious carpet that comes from the power loom, and previously manufactured only in France and England on hand looms, dates only from the year 1867. A patent for weaving these carpets by power was awarded to Alexander Smith and Halcyon Skinner in 1856; but the destruction of their factory by fire, and other obstacles, prevented its utilization until 1867, since which time the product of their mill has in some years equaled the entire annual production of these high grade carpets in France and Great Britain.

The census record of the statistics of carpet manufacture begins with 1850, and its subsequent growth by ten-year periods is epitomized in the following table:

STATISTICS OF CARPET MILLS: 1850–1890.

YEARS.	Number of establishments	Capital.	Miscellaneous expenses.	Average number of employés.	Total wages.	Cost of materials used.	Value of products.
1850	116	$3,852,981	.....	6,186	$1,246,560	$3,075,592	$5,401,234
1860	213	4,721,768	.....	6,681	1,545,692	4,417,988	7,857,636
1870	215	12,540,730	.....	12,098	4,681,718	13,577,993	21,761,573
1880	195	21,468,587	.....	20,371	6,835,218	18,984,877	31,792,802
1890	173	a38,208,842	$1,819,441	29,121	11,633,116	28,644,905	47,770,193

a This amount does not include the value of "Hired property".

Although there has been a decrease in the number of carpet manufacturers reporting from 195 in 1880 to 173 in 1890, there has been a very marked increase in the capital, in the number of employés, in the amount of wages, and in the quantity and value of products. The number of sets of cards increased from 285 to 392. The number of combing machines decreased from 155 to 118, indicating the great increase in the purchase of yarns by weavers of carpets who find it to their advantage to have their worsted yarns spun for them. Of the combing machines credited to the worsted manufacture in this report a large number belong strictly to the carpet industry, since they are engaged exclusively in making yarns of the numbers 12 to 17, employed only by the carpet manufacturers. They were probably so credited in 1880. The number of spindles employed in the carpet manufacture proper was 208,858, of which 53,046 were woolen, 151,132 worsted, and 4,680 cotton spindles. In 1880 the number of woolen spindles was 32,853, and 82,256 worsted spindles.

These statistics of the spinning machinery of the carpet manufacture are no clew whatever to its status. To a degree unknown in any other branch of wool manufacturing the carpet weavers purchase yarns from spinners whose machinery and product are necessarily classified in this report either with the woolen or the worsted mills. In the city of Philadelphia, where there were 133 carpet mills reporting out of the 173 in the whole country, there were only 12 establishments which spun their own yarns. The decrease in the number of combing machines between 1880 and 1890 shows that this specialization of the industry is rapidly increasing. The loom is therefore the only true guide to the mechanical growth of this industry.

The total number of looms employed in carpet mills has increased from 7,252 in 1880 to 11,235 in 1890. This increase shows the rapid transfer of this industry from the hand to the power loom, the hand looms employed decreasing from 3,995 in 1880 to 2,697 in 1890, and the power looms increasing from 3,257 in 1880 to 8,538 in 1890.

The change from hand looms to power looms did not begin to become general in Philadelphia, the great seat of the industry in the United States, until about 1873. The hand looms had been invariably worked by men; the power looms are almost as generally operated by women, and consequently the increase in production, equaling about 100 per cent, was accompanied not only by a decrease in actual labor cost, but also by a decrease in the wages of weavers. The earnings of power loom weavers have never reached the standards paid to hand loom weavers, although they have been steadily tending upward since 1873.

The substitution of the power loom has proceeded much more rapidly in the United States than elsewhere. Indeed, the carpet manufacture may still be called a hand manufacture, except in the United States. F. H. Wigfall, United States consul at Leeds, reports the number of looms in that district, which is the chief center of the English carpet manufacture, as 1,166 in 1889, of which all but 60 were hand looms. At Tunstall, where the ingrain carpets are chiefly manufactured, the proportion of power looms is no greater. The persistence in the use of the hand loom is explained by Mr. Shoenhof, in a consular report, as due to the fact that the cost of production is nearly the same in both cases, "and hand loom weaving offers to the manufacturer the advantage that he need not sink the greater part of his capital into fixed charges of costly machinery". The hand looms generally belong to the weaver, who is supplied with yarns by the manufacturer, who may thus be a person owning no machinery or buildings of any kind. A hand loom in England costs £13 or $63, while a power loom costs £120 or $580, and a good hand loom weaver will turn out about 60 yards of ingrain carpet per week. Several of the English manufacturers who have introduced the power loom have been successful, and a change similar to that which has occurred in the United States must eventually take place in Great Britain, the experience of this country demonstrating beyond question that it is the most advantageous method of manufacturing.

In the present census there has been secured a closer subdivision of the number of looms employed upon each variety of carpets than has heretofore been made. The number of ingrain power looms has increased from 1,873 to 4,214; the number of brussels power looms from 756 to 1,224, and the number of tapestry brussels looms from 547 to 1,498.

There has been an increased production from this increased weaving machinery very nearly commensurate with the enlarged capacity thus indicated, as is shown by the following table, in which the relative quantities of the different varieties of carpets manufactured in 1890 and 1880 are set forth in detail:

CARPETS.

YEARS.	Total carpets (running yards).	Ingrain, 2-ply (square yards).	Ingrain, 3-ply (square yards).	Ingrain art (square yards).	Venetian (running yards).	Body brussels (running yards).	Tapestry, brussels (running yards).	Tapestry, velvet (running yards)
1890	74,770,910	32,918,659	3,251,368	553,513	.....	9,442,348	20,008,961	2,482,128
1880	39,282,634	21,986,434	862,394	.....	1,984,201	4,077,190	9,441,195	60,000

YEARS.	Wilton (running yards).	Axminster (running yards).	Moquette (running yards).	Smyrna (square yards).	Cottage (square yards).	Dutch (square yards).	Rag (square yards).	All other (square yards).
1890	1,030,101	379,341	3,193,186	127,177	.....	.....	71,310	1,312,818
1880	157,629	303,366	.....	.....	241,220	12,000	157,005	.....

The ordinary ingrain carpet width is one yard, but other carpets are usually made three-quarters of a yard in width. These figures show an increase of about 90 per cent in the production of carpets.

The increase in the manufacture of rugs and art squares is even greater than in carpets. In 1880 the census reported the manufacture of 40,000 separate druggets. In 1890 the druggets are reported in square yards, of which there were 103,258 square yards manufactured. In rugs of all descriptions there were made in 1880 47,530, and in 1890 1,563,303. Many of our largest manufacturers turned their machinery largely to the making of rugs, in response to the popular taste for partially covered floors. The greater part of this manufacture was of the cheaper grades, but the product also contained many rugs of a very high quality of material and workmanship, commendable for the skill and taste displayed in coloring and pattern. While these American rugs do not take the place of the eastern hand made rugs, which remain unrivaled by the products of machine manufacture, they easily stand the test of comparison with any similar work done in Europe.

Just before the census year the setting and weaving the patterns of Smyrna rugs by power looms was successfully achieved in Philadelphia. The patent for this loom became the subject of litigation, and the finding of the court was singular in this, that it states the conception of setting Smyrna rugs by power occurred about the same time to three different persons, namely, Joseph H. Bromley, of John Bromley & Sons; Thomas Bromley, jr., of the Bromley Brothers Carpet Company, and George W. Stewart, of John Stewart & Son. Looms constructed after plans made by each of these gentlemen were in actual operation during the census year. These looms are provided with a double shuttle box on each side, and a mechanism which stops the loom after every two picks, and another by which it

may be started again by the foot. The Smyrna rug or carpet is a double-faced fabric, one side being the fac simile of the other. They are woven with one warp and two wefts, one of the latter consisting of coarse jute, the other of party-colored twisted chenille, a thread of each being shot or thrown alternately. After each weft of chenille is shot, it is necesssary for the weaver to set or adjust it with reference to the preceding weft of chenille, so as to form the figure, and to accomplish this the loom must be thrown out of action, after every second shot or pick. The mechanism above described successfully accomplishes the stopping and starting of the loom for these purposes. Before 1889 none of these carpets or rugs were made except upon hand looms; and of the 127,177 square yards of carpets reported as manufactured in the census year, almost the whole were of hand manufacture. The first Smyrna carpets manufactured in the United States date from about 1877, and the quantity made in 1880 was so small that they were not separately reported.

The American carpet manufacturers have won the command of their home market in all grades and styles of carpets, except the hand-made rugs referred to. The importations have fallen steadily, until in 1890 they comprised less than 600,000 square yards, valued at $1,564,890, nearly the whole of which quantity consisted of eastern hand made rugs. They have been aided in this achievement by the skill and good taste they have shown in the preparation of patterns and colors and by loyalty to the requirements of high art. Some deficiencies in dyeing, which interfered with the popularity of their high grade products in the earlier years, have been entirely overcome. The American industry as it stands to-day has a capacity to supply every variety of carpet required to meet every possible want, from the rich and luxuriant wilton and axminster, of limited demand and high price, through all the medium grades to the sightly and useful carpet, composed of the cheapest materials and adapted to the most modest homes.

Of the total product of carpets reported in 1890 the state of Pennsylvania produced 41,198,175 square yards, or 55.10 per cent.

CLASS IV—FELT GOODS.

The felt manufacture has been one of the distinctive features of the industry in the United States, although the volume of its products is small compared with those we have been considering. It was first separately enumerated in 1880, and the growth of this branch in the interval is shown in the following table:

STATISTICS OF FELT MILLS.

GENERAL HEADS.	1880	1890
Number of establishments	26	34
Capital	$1,958,254	a$4,460,621
Miscellaneous expenses	.....	232,871
Average number of employés	1,524	2,266
Total wages	$439,760	$1,041,296
Cost of materials used	$2,530,710	$2,809,937
Value of products	$3,619,652	$4,654,768

a This amount does not include value of "Hired property".

The products of felt manufacture constitute an almost innumerable variety of articles. The largest single item is felted cloths, of which 2,628,546 square yards are reported, valued at $986,888. These cloths are used for a great variety of miscellaneous purposes other than clothing, into which they do not largely enter, except as skirts and skirting. They were among the earliest forms of wool manufacturing attempted in the United States, Mr. Thomas R. Williams, of Newport, Rhode Island, having succeeded in inventing about 1820, the process of making felt cloth of commercial length, which he patented in England in 1830, and which was subsequently successfully operated in the Bay State mills at Lawrence, under exclusive rights, for many years. The exceptions to this monopoly were a fabrication of felt cloths, conducted in Norwich, Connecticut, under the Bishop patent, and the manufacture of hat bodies, conducted under the Wells patent. It is an interesting historical incident that this simple method of working wool, which was undoubtedly the earliest form of the manufacture in antiquity, should have passed almost wholly into desuetude until it was revived and perfected by one of our own countrymen. M. Koeppelin, a French expert, writing in 1869, made the following allusion to the subject:

> In spite of the simplicity of its fabrication, and in spite of the antiquity of its origin, felting was for a long time abandoned to the lesser industries. It is only within thirty years that the mechanical fabrication of felted cloths has been essayed. Many fruitless attempts were made in this direction in France and in other countries, and it is only to the inventive genius of two Americans, Wells and Williams, that we owe the processes now in use, and which have not been materially modified since the epoch of their discovery.

These processes were at once applied in France and England, and they are now extensively employed in the latter country in the manufacture of printed felt carpetings, which are exported to all parts of the world and are popular because of their comparative cheapness. The production of these felt carpetings is relatively small in this country, 185,338 square yards being reported under the head of druggets, with a value of $91,742, their place being supplied by the cheaper grades of ingrain carpeting. Other forms of goods produced in the felt mills are

table and piano covers, hat felts, saddle felts, and rubber shoe linings. The miscellaneous products of the industry which are not separately enumerated include felt slippers and shoe soles, sheathing materials, polishing felts, for polishing furniture and marble, etc. There is an almost infinite variety of forms into which felted wool is manufactured, and nearly all of them are successfully conducted in this country, though generally on a small scale.

One highly important form of felt manufacture which has been successfully introduced since the last census by Alfred Dolge, at Dolgeville, New York, is the making of piano felt, for piano keys, an industry which was previously confined to two factories in England, two in France, and four in Germany.

Another considerable product of the felt mills are the endless belts used as blankets for paper making machines. This material is a woven fabric, very highly felted to produce strength and endurance, and it requires great care and nicety in its manufacture. 216,982 square yards of this blanketing was produced in the census year. The census of 1880 made no return whatever of these blankets; and, as a matter of fact, there were but few of them made in this country at that time, the paper manufacturers finding that the American blankets were inferior to those made in Germany, where practically all of these blankets were made up to a recent period. Since the manufacture was begun in good earnest in this country constant improvements have been effected in this class of goods, which have indirectly resulted in marked reductions in the cost of paper. The domestic production of these blankets is already largely in excess of the imported quantity. A single decade has therefore sufficed to enable our manufacturers to conquer this branch of the industry.

CLASS V—WOOL HATS.

The manufacture of wool hats has always been an important branch of our domestic wool manufacture. In his tables, prepared on the basis of the returns of the census of 1810, Tench Coxe reported the value of "hats made of wool, fur, etc., with mixtures of them", to be $4,323,744. Of this production about $100,000 was exported, and as the importation of hats of all kinds were then valued at but $350,000, it will be seen that the industry then occupied a unique position and possessed a relative importance among the occupations of the people which it long since lost. The industry was at that time essentially a household one, and was one of the last branches of the wool manufacture to adapt itself to factory conditions.

Up to about 1822 each locality had, in addition to its sawmill, gristmill, store, and blacksmith shop and shoemaker's shop, the hat shop, in which the boss hatter, with one or two apprentices, manufactured hats for the surrounding district. This primitive establishment latterly obtained its supply of stock from the city merchants, who furnished the carded wool, the web being wound on a drum, thus forming a bat or lap, as it was sometimes called, or by allowing the web to fall directly on the floor. The wool was manipulated by the hatter by means of the bow and bowstring, which was skillfully applied to the carded wool until it was flattened out into a hat of irregular form; then, by ingenious handling and putting a number of the bats together, the hat body in conical shape was finally formed. In 1822 a machine was invented for forming wool hat bodies. This machine operated by winding the web from the doffer directly upon the cone and forming one body at a time, the web being wound straight around the cone without crossing. Three years later the double cone former, which crosses the web by a vibrating motion and runs it from one end of the cone to the other, at the same time revolving on conical cylinders and covering the entire cone, was invented and patented. This machine, with many improvements, is still in use. Various other machines, also designed to form hat bodies automatically, were invented in subsequent years by American mechanics, and the factory manufacture of wool hats soon deprived the local hat maker of his occupation. A marked reduction in cost was effected and the consumption greatly increased in consequence. Between 1830 and 1840 a number of hat manufactories came into existence and steadily increased their facilities for production. The hand manufacture of hats had been obliged to use lamb's wool only, as the bowstring would not work except upon the straight fiber of the lamb's fleece. With the machine manufacture wool of any kind sufficed, provided it possessed the requisite felting qualities. From 1830 to 1845 the fine German Saxony lamb's wool and also the fine Spanish wools were largely used for hat bodies as possessing the best felting qualities. The wool hat manufacture had been subject to the vicissitudes of fashion more disastrously, perhaps, than any other branch of the industry. The silk hat, when it first made its advent about 1845, nearly prostrated the wool hat industry, especially those establishments which had been engaged in making the finer qualities, napped with fur. At a later date the development of the fur hat industry affected the wool hat manufacture even more seriously, and the effect of the competition is strikingly shown in the present statistics.

The statistics of the industry have been very irregularly reported in the census, owing to the fact that the increasing use of other materials than wool has made it less and less distinctively a branch of the wool manufacture. Prior to 1860 no separation was attempted. From the census of that year it appears that the industry consumed 3,039,700 pounds of wool and 1,658,520 pounds of fur, and produced 6,191,482 wool hats and 2,462,974 soft or felt wool hats, as compared with 2,449,672 fur hats. At no subsequent census has the number of wool hats equaled the number of fur hats manufactured, and the latter now greatly predominate.

The census of 1870 made no separate return of wool hats, but included them among the 483 establishments making hats and caps of all descriptions, to the value of $24,848,167. The trade data for that year indicate that there were then about 300 sets of 24-inch cards employed in the United States in the manufacture of wool hats, with a daily capacity of 15 dozen hats to the set. The census of 1880 showed 362 sets of cards employed in the industry, manufacturing 1,391,862 dozen wool hats, value not separately given. The census of 1890 shows the number of sets of cards reduced to 229, and the product of wool hats reduced to 972,475 dozens, valued at $4,612,151, or an average value of $4.74 per dozen. These figures illustrate the manner in which the wool hat manufacture has suffered from the competition of the fur hats, made originally from the fur of the beaver, and since that disappeared, from the fur of rabbits, hares, kangaroos, and similar animals.

The wool hat manufacture is thus rapidly being superseded by that of fur hats, as may be inferred from the following comparative table:

STATISTICS OF WOOL HAT MILLS: 1880 AND 1890.

YEARS.	Number of establishments.	Capital.	Miscellaneous expenses.	Average number of employés.	Total wages.	Cost of materials used.	Value of products.
1880	43	$3,615,830	.....	5,470	$1,893,215	$4,785,774	$8,516,569
1890	32	a4,142,224	$249,568	3,592	1,363,944	2,802,041	5,329,921

a This amount does not include value of "Hired property".

These figures do not mean that the manufacture of hats has fallen into decadence in the ten years, but simply that the fur hat is superseding the all wool hat in popular favor. In consequence many of the mills formerly engaged exclusively in the wool hat manufacture now produce chiefly of the other variety, and the statistics of their mills have therefore been transferred to the other industry. In the materials consumed in the manufacture of fur hats is included a large quantity of wool, the record of which is lost to this inquiry.

CLASS VI.—HOSIERY AND KNIT GOODS.

Not unlike the worsted manufacture in the rapidity of its development, and almost equaling it in the value and volume of its products, is the manufacture of hosiery and knit goods. The knit goods industry did not exist in this country as a branch of manufacture, properly so called, until 1832, when the principle of knitting by power was first successfully attained at Cohoes, New York, by Egbert Egberts. His machine was simply the square stocking frame of William Lee adapted to power. It produced a stocking web 28 inches wide at the rate of one inch per minute, which was cut off at proper lengths and shaped and seamed to form the stocking. The cost of manufacture was thus reduced to nearly one-tenth of what it had formerly been, and the enormous possibilities of the new industry were at once foreshadowed. It inaugurated a revolution in the character of underwear. Practically all this wear had been, up to that time, flannel goods, specially manufactured for that purpose, and fashioned and sewn at home, according to the individual needs. How nearly universal has become the use of knitted undergarments, how much more extensive has become the use of underwear, how vastly the comfort, the convenience, and the health of the masses have been promoted by this revolution, are too familiar to enlarge upon.

It took many years to impart momentum to this impending revolution. Ten years after Bailey's power machine had been in operation the whole value of stockings, woven shirts, and woven drawers produced in the United States was not over $500,000. The machine itself was still far from a perfect automatic machine, and it had not yet been introduced at all in England. Cognizance of the existence of this industry was not taken by the census until 1850. The rapidity of its development from that date is shown by the following table of the comparative statistics of the industry:

STATISTICS OF HOSIERY AND KNITTING MILLS: 1850–1890.

YEARS.	Number of establishments.	Capital.	Miscellaneous expenses.	Average number of employés.	Total wages.	Cost of materials used.	Value of products
1850	85	$544,735	.....	2,325	$360,336	$415,113	$1,028,102
1860	197	4,035,510	.....	9,103	1,661,972	3,202,317	7,280,606
1870	248	10,931,260	.....	14,788	4,429,085	9,835,823	18,411,564
1880	359	15,579,301	.....	28,885	6,701,475	15,210,951	29,167,227
1890	796	a50,607,738	$3,627,245	61,209	18,263,272	35,861,585	67,241,013

a This amount does not include value of "Hired property".

The number of knitting machines employed in the manufacture, all descriptions being grouped without reference to kind or capacity, increased from 13,038 in 1880 to 36,462 in 1890. There is no earlier record of the number of knitting machines.

The original establishments for the manufacture of knitted fabrics were small, and most of them continued to utilize knitting frames operated by hand. A factory at Portsmouth, New Hampshire, had been started in 1834, which did not introduce power until 1844; and in 1850 that state, now one of the largest producers of this class of goods, turned out a product of 3,000 dozen pairs of hosiery per year, a production considered so enormous that the managers of the single mill in existence doubted if a demand for this supply could be sustained. (*a*)

A new impulse was given to the industry by the adoption of the circular knitting machine invented by Pepper in 1851, and the subsequent introduction of the somewhat similar machine invented by the Messrs. Aiken, father and son.

Improvements on these early machines followed rapidly during the next twenty years, the most important among them being of American origin. The number and variety of patented improvements in machinery specially adapted to this class of industry has exceeded those in any other branch of the textile manufacture. Notable among them was the machine of E. E. Kilbourne, first patented in 1858; the first automatic machine for the making of full fashioned goods, which effected a second revolution in the industry.

But the basis of the present development of the industry was the outbreak of the civil war, during which the government became an enormous purchaser of the heavier and staple classes of hosiery goods, such as woolen shirts, drawers, blouses, and stockings. The great demand from this source, re-enforced by the complete protection which the tariff afforded, and the high prices of gold and exchange, led to the introduction of the manufacture of the finer styles of knitted goods, which had not been previously attempted in this country. Looms and machinery adapted for these goods were brought from abroad, skilled workmen were secured, and the knit-goods industry rapidly expanded to national importance.

Merchantable hosiery and knit goods are of three varieties, as respects the stock used: goods made wholly of wool, those made wholly of cotton, and those made of wool and cotton mixed. The last are known commercially as "merino" goods. The word "merino", meaning originally the fine wool of a Spanish breed of sheep, has come to have this secondary and commercial meaning, for no reason that can be explained, but it is fixed and universally understood. The proportions of goods thus made, as respects material, are determined by the demands of the consumer. The tendency to the larger use of cotton is perceptible. The all-wool underwear, while commended in many quarters on hygienic grounds, contends with the obstacle of high prices, the objection that it shrinks excessively, and that it carries more warmth than is required or desirable during the greater portion of the year. These objections are met by the mixture of cotton with the wool in the spinning of the yarn. From the proportion of half and half, the percentage of cotton employed increases until we reach the all-cotton fabric, of which immense quantities are made, especially of the lighter grades for summer wear. On the basis of this division the product of the country in the census year was divided as follows:

KINDS.	TOTAL.		HALF HOSE.		HOSE.		SHIRTS AND DRAWERS.	
	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.
Total	.....	$67,241,013	7,078,505	$7,434,131	10,062,886	$11,728,075	6,861,657	$32,961,997
Woolen	4,692,209	16,497,395	1,360,824	2,892,822	2,242,544	4,722,796	1,088,841	8,881,777
Merino or mixed	3,335,362	16,451,999	376,053	604,773	433,083	791,227	2,526,226	15,055,999
Cotton	15,975,477	19,174,809	5,341,628	3,936,536	7,387,259	6,214,052	3,246,590	9,024,221
All other goods	.....	15,116,810	.....	.....	.....	.....	.....	.....

In the production of these goods raw wool, woolen yarn, and worsted yarn, aggregating 32,171,798 pounds and valued at $16,325,020 were used, as against 13,098,714 pounds of the same, valued at $7,433,708, used in 1880. Of cotton and cotton yarns used in their production the quantity was 64,681,466 pounds, valued at $11,301,188, as compared with 28,485,238 pounds of cotton and cotton yarns, valued at $4,547,557, used in 1880.

In addition to the above values cognizance should also be taken of the hosiery and knit goods products composed exclusively of silk, and separately reported under the silk manufacture, to the value of $1,156,172. This is a new development of the industry, which has almost wholly arisen during the past ten years.

The smaller products of the knit goods industry are too numerous for separate classification and enumeration. In addition to hosiery and underwear they comprise a great variety of fancy goods, such as ladies' hoods, shawls, sontags, nubias, scarfs, comforters, basques, afghans, leggings, mits, gloves, and the like, besides jersey cloth, which is simply a fabric knitted instead of woven, of which there were 3,065,057 square yards produced in the census year, valued at $2,157,692.

In the manufacture of these fancy knitted goods, as well as of many qualities of stockings, the line of demarcation between factory and household manufacture often disappears. A number of large houses in the eastern states, who are described as manufacturers, possess no factory and employ no power. They buy yarns in

a Bulletin National Association of Wool Manufacturers, xi, 62.

large quantities, which are given out to women in the surrounding towns to be knitted at home into such special goods as the market requires. This method of manufacturing, as applied to these particular goods, has greatly increased during recent years; and the difficulties attending a complete enumeration of the quantity and the value of products thus manufactured are insurmountable. There are millions of dollars worth of goods so made and sold which have escaped the vigilant search of the census agents. Another large product of knitted goods is enumerated with the glove industry, entering into goods whose chief material is some form of leather. Taken in all its ramifications therefore, and including products which are of semihousehold manufacture, this industry is much larger, in the value of its products, than the statistics indicate.

It is a characteristic of the manufacture of knit goods by machinery that while a vast saving over knit goods by hand is effected, there still remains, for many of its products, a large portion of the work which must be done by hand connected with the finishing of the goods.

SUMMARY AND CONCLUSION.

This investigation has shown that the domestic wool manufacture had reached a point of development, in 1890, where it was fairly on a par in many particulars with the same industry in European countries. Its relative importance may be partially measured by the fact that its consumption of wool now exceeds that of all other nations, with the exception of Great Britain, and that the home production of goods now meets the requirements of the home market, with the exception of about 11 per cent of the total value of the annual consumption of woolen goods, which is supplied by importations derived about equally from Great Britain and from the manufacturing countries of continental Europe. It is believed that this percentage of importations does not materially differ from that which prevails in these foreign countries, but on the other hand it is to be remembered that the United States is the only large wool manufacturing nation which does not manufacture at all for export.

It would not be proper to conclude this report without allusion to certain points of inferiority, both in general method and in the production of limited lines of goods, which are recognized by practical manufacturers who have carefully studied conditions, here and abroad. In England, for instance, organization is better and attention to details is more thorough in consequence. In what may be called the economies of manufacture, the English surpass our own manufacturers as a rule and are probably not surpassed in the world. They have been trained in these economies by their long experience in catering to foreign markets, where they encounter a constantly closer competition. They possess certain definite advantages growing out of the less mobile character of the operative classes. It is common for English workmen in the textile industries to pass their entire lives in the same mill at the same class of work. In the United States the factory population is constantly shifting, not only from mill to mill, but from town to town and into different occupations; and there is increasing difficulty in obtaining and retaining properly trained help. These conditions naturally affect not only the economies of manufacture, but also to a certain extent the quality and character of the products. There are lines of high-grade goods in which the American product does not regularly approach the fineness and perfection of finish peculiar to the goods of foreign mills, which have been exclusively employed on those particular lines for generations. This is especially noticeable in connection with certain products which are the peculiar glory of the French manufacture.

Other conditions have had their bearing in the struggle to overcome this inferiority. Some of these may be described in detail.

I. In England the system of sorting and classifying wools is carried to such perfection that the wool market is amply supplied with all the different sorts, so that the manufacturer may profitably run his mill on the finest or the lowest sort. From the want of concentration of wool in our markets, and other causes, the American manufacturer sorts his own wool, and having it of different grades must make goods of corresponding grades. He must make low as well as high class fabrics; and it has followed that there has been less tendency on the part of the domestic manufacture to confine itself to single specialties, and to base reputation and success upon those specialties.

II. American manufacturers have been handicapped by the comparative lack of expert training in the important departments of designing and dyeing. While the importance of a close and skillful attention to the selection, preparation, and spinning of wool is not easily overestimated, yet it has become more important every year that the highest skill shall be employed in determining the organization of fabrics, both as to pattern and coloring. The wool manufacture has entirely changed in the last sixty years in this respect. Formerly it was employed upon plain textures, of plain colors. The introduction of fancy goods has made it impossible to determine from one season to another what freak or fluctuation in the popular taste will next dominate the market. In this state of facts the designing department becomes the real key to the success of the mill. To study the tendencies of the times, to anticipate them if possible, to capture public favor by novelty of design or pattern, is an art which only long training can impart to great natural aptitude. In the same way the mysteries of the dye house are a study worthy of the highest mind, and the introduction of the aniline dyes has made possible new combinations and shades of coloring, which are constantly appearing.

III. The facilities for technical education in these important departments of manufacture are far superior, in all the manufacturing countries of Europe, to anything existing in the United States. Textile schools exist in Germany, Belgium, Austria, and France, equipped with the most skillful instructors and every appliance, supported wholly or in part by the government, which turn out annually large bodies of carefully trained young men, who take their places in the factories, where they supplement by practical experience the instruction they have received in every department of the manufacture. Of late years similar educational institutions have been established at the chief textile centers of England, also the recipients of public support, and they have rapidly advanced to an efficiency almost equal to that of the continental schools. The influence of these institutions upon the development of the textile industries of the countries in which they are located has been greater than we realize in this country, where we have depended, for the education of experts, upon the schooling of the mills themselves. One school, the Lowell School of Design, connected with the Massachusetts Institute of Technology, has for many years supplied in a limited degree a training somewhat similar to that obtained in these foreign schools. In 1883 a second school, planned to cover instruction in all branches of the textile industry, was

established in Philadelphia, in connection with the Pennsylvania Museum of Fine Arts, through the liberality and public spirit of a few of the leading manufacturers of that city. It has already achieved a notable success, and its graduates are found in the leading mills throughout the country. But its resources are limited, and its capacity still more so, in view of the enormous development of our textile industries during the last quarter of a century. The more successful of our designers and experts in dyeing still come to us from across the water. The United States is far behind Europe in its facilities for the training of men and women in the great work of the application of art to the textile manufacture.

IV. In the mechanical departments, the best American mills do not at present suffer in comparison with those of any other country. It is well known that in the earlier years of the century our manufacturers were terribly handicapped by the inferiority of their machinery. This inferiority they gradually overcame, largely by original inventions, and in other particulars by the importation of foreign-built machinery. The catalogue of American contributions to the mechanical development of wool manufacture is so imposing that the late Dr. Hermann Grothe, the German expert, was led to write that it is not surpassed by that of any other nation, not excepting even England. (*a*) He says there are repeated cases where American finishing machinery has been exported to England and France to become the basis of other improvements, claimed to be original, and essentially contributing to the establishment in those countries of the textile industries. This is prominently the case, he adds, with the machinery for fulling, gigging, and shearing cloth; the fulling mill with rollers is completely an American invention (that of John Dyer, patented in 1833); the invention of the double-crank shaft fulling mill was made by Levi Osborne in 1804, commencing a great series of constructions of the same principle; all the English gigging mills were patented after the gigging mills in America of Christie Olney, Barrows, Beck, Wells, and others, had appeared; the merit of the invention of the cylinder shearing machine belongs to Samuel Griswold Dorr, and of the pressing machine with steam to Seth Hart, who received a patent in 1812. The invention of machinery for the manufacture of felted cloths is exclusively American in its origin. The principle of all the machines for burring wool used here and abroad, viz, striking the burr from a card or toothed cylinder by means of a rapidly revolving guard or blade, was first applied to a machine about 1833 by Michael H. Simpson, of Boston, whose improvements upon the Couillard combing machine were also of a nature so radical as to entitle them to rank as original inventions. Allusion has already been made to the Goulding invention, which dispensed with the billy, and which has been described by Dr. Hayes as "the most important of all contributions to the card-wool industry of the world during the present century". Power was first applied to the knitting machine in the United States in 1832 by Egbert Egberts, at Cohoes, New York, and in the variety, the ingenuity and the importance of the knitting machines for making fashioned knit goods the American contributions are more important than those of all other countries combined. The power carpet loom, in all its varieties, is wholly an American conception. Of looms generally it is recognized that the American inventions and subsidiary appliances are superior in every respect to those of any other country, and they are now made and largely used abroad under concessions from the patentees.

In the subsidiary improvements of machinery for the manufacture of wool, in the scouring machines, the feeding appliances, the automatic stop actions, the thousand smaller mechanisms which increase efficiency and production, which economize labor, and impart regularity and perfection of manufacture, the American contributions have been innumerable, and they have advanced the manufacture, in matters of detail, quite as far, although by less radical steps, as the machines which involved the application of some new principle in mechanism. Many of our mills are in no sense behind the best English mills in the application of these minor mechanisms. While the American visitor in English mills will be struck with some radical points of difference in equipment, he will conclude that in point of general mechanical efficiency the industry occupies practically the same footing in both countries.

The most-striking point of difference in mechanical organization lies in the fact that English mills, like those of France and Germany, are as a rule equipped for special classes of work, to the exclusion of all others, while the American mills as generally are equipped for a great variety of processes and of products. The advantages gained by this specialization are too obvious to be dwelt upon at length. A worsted spinning mill, equipped to make a particular number of yarn, will produce that yarn with a greater economy than an American mill, equally perfect in machinery, which is compelled to constantly adjust that machinery to the production of yarns of different numbers. Elsewhere in this report allusion is made to the entirely different system of manufacturing which prevails in England, and to the advantages which spring from it.

V. The United States is the only one of the large wool manufacturing nations which does not have free access to the wool markets of the world. It has developed its wool manufacture along lines very largely determined by this unique position among its competitors, and comparison with other countries is made more difficult on this account. To offset the fact stated, it is true that the United States is the only large wool manufacturing nation which supplies within itself the larger proportion of the raw material consumed in its mills. Of the wool consumed by Great Britain in 1890, 120,000,000 pounds was home grown and 350,000,000 pounds foreign grown. France consumed in the same year 124,000,000 pounds of domestic wool and 295,000,000 pounds of imported wool. The

a Bulletin National Association of Wool Manufacturers, xi: 59.

United States reversed these proportions, consuming 258,681,000 pounds of domestic and 114,116,000 pounds of imported wool, three-quarters at least of the latter being third-class wool consumed in the carpet manufacture. The consequence of this dependence upon a domestic supply has been to very largely persuade the home manufacturer into the production of those classes of goods to which the wools of the United States are best adapted, and for which it is conceded that they have no superiors.

Since the policy of a tariff on wool for the purpose of fostering domestic production was first adopted by the United States the conditions surrounding the wool supply of the world have radically changed. At that time each manufacturing nation relied chiefly upon its home supply of the raw material—England, in particular, depending almost wholly upon her domestic clip, which had been recognized for centuries as one of the chief sources of the national wealth. In 1830 the exported wool clip of the Argentine Republic was barely 60,000,000 pounds; in 1890 it was 258,000,000 pounds, and in previous years it had surpassed 350,000,000 pounds. In 1842 the Australian export of wool was 14,000,000 pounds, that being the first year in which its statistics were recorded; in 1890 the Australian wool clip was 550,000,000 pounds. The Cape of Good Hope clip has increased from 26,000,000 pounds in 1860 to 128,681,000 pounds in 1890. These three countries, which were hardly a factor in the world's wool supply in 1830, are now the sources from which is drawn nearly two-thirds of the clothing and combing wools.

The economic influences of these changes in the sources of the fine wool supply can hardly be traced or estimated, although they are visible everywhere. The United States has been exempt from them, to a very large degree, so far as the manufacture is concerned, not more than 36,000,000 pounds of these wools having reached this country in any one year. But the effect of this constantly increasing new supply of raw material, a supply which at times has seemed to increase faster than the demand, has been very perceptible in the domestic wool markets, where the prices of domestic fleece have sympathized closely with the fluctuations in prices abroad. The average annual price of the average Port Philip fleece has fallen in the London market from 25 pence in 1873 to 16 pence in 1890, and of Buenos Ayres average greasy from 7 to 5 pence between the same years, while the decline in Ohio medium fleece was from 68 cents in 1873 to 37 cents in 1890. In view of the steady forcing down of the price of domestic wool, notwithstanding the tariff, by the pressure of increased production, on a large scale, in these countries of the southern hemisphere, where the conditions attending sheep raising are in some respects superior to those of our own country, it may be taken for granted that there will never be any considerable exportation of domestic wool.

On the other hand, it is not to be expected that there will ever be any considerable domestic supply of the coarse long wools chiefly relied upon by our great carpet industry. The sheep producing these wools are comparatively worthless for mutton, their fleece is light in weight, and because of its coarseness brings a comparatively low price in the market. The culture of such sheep is not likely to be pursued as a final object where any purpose is entertained of improved sheep husbandry, and in those sections of the United States where the native sheep of Mexican origin have predominated the breeding up has been rapid. We have produced admirable carpet wools in Colorado and the territories, equal in whiteness, strength, and length of staple to the best imported from South America. But the supply of domestic carpet wools now reaching the markets is merely nominal, and it is a fact well recognized by intelligent growers that carpet wools can not be grown with profit in this country, and therefore that practically they can not be grown at all.

In the production of the finer wools the domestic supply, instead of increasing in consonance with the increased requirements of the American manufacturers, is growing less from year to year. In Pennsylvania, Ohio, Michigan, and other states which are peculiarly adapted to the growth of fine wools, and from which the domestic supply has come, the number of sheep has been steadily declining for many years. While improvements in machinery have permitted a larger and larger use of the increasing supplies of territorial wools for purposes akin to those of the fine wools, yet there exists a deficiency, which is made up by increasing importations of Australasian wools. It is frequently asserted that the United States possesses every variety of soil and climate and all the food conditions necessary to produce every grade of wool in quantities equal to the utmost domestic demand. Regarding this proposition, it is enough to say that if the conditions exist the supply does not, and that the deficiency must therefore be made up from foreign sources. The increase in our importations of Australian wools has been the most marked characteristic of the industry during the decade ending with 1890. The records of the Treasury Department do not contain the complete details of Australian wool imported in 1879 and 1880. The direct importations were 399,518 pounds in 1879 and 7,666,604 pounds in 1880, additional supplies coming in both years from the London auction sales. In 1890 the importations direct and via London reached a total of 11,950,158 pounds, and in several prior years were even more, reaching 16,577,974 pounds in 1886. While these importations are insignificant in amount when compared with the domestic wool clip, they are very large in comparison with the domestic clip of strictly fine wool of a like grade. In making their purchases of Australian wool the American manufacturers and dealers are confined to the wools of lightest shrinkage, upon which the duty operates the least severely, and as the supply of light-shrinkage wools is limited, the American competition influences to increase their price over that of other wools of like quality but heavy shrinkage, thus further limiting their purchases as compared with what they would be under an ad valorem form of duty.

VI. Another disadvantage under which the domestic wool manufacture labors, is the fact that it is, and always has been, subject to conditions by which styles and fashions are determined abroad. London sets the fashions in men's wear goods, and Paris in women's wear goods. The American manufacturer, except the maker of plain and staple fabrics, is compelled to follow the styles determined in these cities, if he expects to command the home trade. This is always a difficult and sometimes an impossible thing to do, under the existing system which compels the manufacture of goods fully a year in advance of the season for whose wear they are intended. The difficulty is greatly increased by the survival of the prejudice born in the primitive days of the manufacture, in favor of foreign as against home-made woolens. This prejudice is disappearing, but it is still a positive factor which must be recognized. Mr. H. N. Slater, of Webster, Massachusetts, in a letter written in 1888, stated the degree of this prejudice and the common method of meeting it, as follows:

> Our family has been engaged in the broadcloth manufacture in this town since 1818, during which time more or less fine Saxony wool has been required and imported for us. * * * These superfine cloths have never been sold directly to the merchant tailor as American, and could not now be if manufactured. The impression is general among the trade that they can not be made in this country, the average consumer wanting something "foreign". During many years (forty years ago) our goods were made, tilloted, and sold (but not as a rule directly) as foreign goods. No merchant tailor thinks of offering a fashionable gentleman a fine American cloth.

The habit of affixing foreign labels to home-made goods is still a common one, and is a device warranted by a prejudice which is no longer justifiable on any ground, and is in strange contrast with the intense Americanism of our people in other respects.

In the facts last stated may be found one of the chief reasons why the quantities and values of woolen goods imported into the United States have exceeded those in any other manufacturing industry, with the single exception of iron and steel, almost from the beginning of the century. In its ratio to the value of the domestic product, the value of woolen goods imported has largely exceeded that of the imports of iron and steel. What this ratio for woolen goods has been at each of the census periods from 1820 is shown in the following table, which also gives the value per capita at each of the census periods, both of the domestic products and the importations, and the percentage of each in the total consumption of the year:

COMPARATIVE STATEMENT OF DOMESTIC AND IMPORTED WOOL MANUFACTURES, WITH PER CAPITA VALUE AND PERCENTAGE OF TOTAL CONSUMPTION. (*a*)

DOMESTIC MANUFACTURES (CENSUS).		Value per capita.	Per cent of total consumption.	NET IMPORTATIONS (AVERAGE FOR 10 YEARS).	Value per capita.	Per cent of total consumption.
Years.	Value.			Value.		
1820	$4,413,068	$0.46	39.15	*b*$6,859,702	$0.71	60.85
1830	14,528,166	1.13	63.67	8,290,062	0.64	36.33
1840	20,696,999	1.21	59.74	13,950,772	0.82	40.26
1850	49,636,881	2.14	79.24	13,005,852	0.56	20.76
1860	80,734,606	2.57	72.04	31,333,273	1.00	27.96
1870	217,668,826	5.65	86.82	33,046,521	0.86	13.18
1880	267,252,913	5.33	87.11	39,537,694	0.79	12.89
1890	337,768,524	5.39	88.63	43,345,981	0.69	11.37

a Cotton hosiery and knit goods, included in the census figures of this table, are not included in the value of imports.
b Net imports for year ending September 30, 1821.

The value per capita of the domestic manufactures in 1870 is a currency value, at a time when the gold value of the dollar averaged 79.81 cents. Allowance being made for that fact, the per capita valuation of the product has shown a nearly uniform increase in each decade since 1860, and was in 1890 just 2.10 times the value per capita in 1860. In other words, the increase in the industry has been in more than double the ratio of the increase in the population. The decrease in the per capita value of the imports of woolen goods has not been in the same ratio, showing that the consuming capacity of the American people has kept steadily in advance of the increasing productive capacity of the wool manufacturers. The percentage of foreign goods in the total annual consumption of our people is now no larger than it is in Great Britain.

In considering the following tables, presenting the data for all branches or subdivisions of the wool industry, reference should be made to the text and tables on the combined textile industries which precede this report.

Tables 1 and 2. To enable a convenient comparison of the statistics relating to the wool manufacture at different census periods, Table 1 comprises all the items of the inquiry common to a number of such periods, and the statistics are given for each decennial year from 1840 to 1890, both inclusive; this is followed by a similar statement (Table 2) for the manufacture of hosiery and knit goods. Particular attention is invited to the fact that these comparative tables include the results of widely varying methods of inquiry, so that a careful consideration of the explanatory footnotes is essential in order to avoid erroneous deductions.

Table 3 contains the totals by states for the principal items of the inquiry for 1890, considering the industry as a whole and including the manufacture of hosiery and knit goods.

Table 4 exhibits a total for the United States, under each item of the schedule of inquiry for 1890 (excepting details relating to employés and their wages), for each branch of the industry, viz, woolen mills, worsted mills, carpet mills (other than rag), felt mills, wool hat mills, and hosiery and knitting mills. The general heads under which the itemized statistics will be found are as follows: Capital, miscellaneous expenses, power, machinery, materials, and products.

The six tables following Table 4 correspond thereto in form and scope, but contain statistics for each of the different branches of the industry which are segregated in these tables and shown by totals for each state and for the United States. Their titles are as follows:

Table 5. Woolen mills.
Table 6. Worsted mills.
Table 7. Carpet mills.
Table 8. Felt mills.
Table 9. Wool hat mills.
Table 10. Hosiery and knitting mills.

Table 11 is a presentation of employés and wages for the wool industry considered in its entirety. It shows, by totals for each state and for the United States the average number of men, women, and children distributed into the following classes: (1) Officers or firm members actively engaged in the industry or in supervision; (2) clerks; (3) operatives and skilled labor; (4) unskilled labor; (5) pieceworkers.

The average number of weeks employed, the average weekly earnings per employé, and the total wages are shown for men, women, and children in each class, excepting pieceworkers. The statement for pieceworkers gives the total number of men, women, and children, respectively, and the total wages reported for each.

Table 12 presents the employés and wages for each of the six branches or subdivisions of the wool industry in the same form as Table 11, showing totals for each state and for the United States.

Table 13 shows for the wool manufacture in its entirety the various weekly rates of wages paid, and the average number of men, women, and children employed at each rate, by totals for each state and for the United States.

In Table 14 the data contained in Table 13 are segregated and shown for each branch of the industry, by totals for each state and for the United States.

Table 15 contains the data relating to custom carding mills, which have been included as woolen mills in the preceding tables; they are segregated in this table, and a distinct presentation is made by totals for states and for the United States.

Table 16 shows details, by totals for states and for the United States, relating to the number of establishments idle during the census year, their capital and machinery.

Table 17 contains a detailed presentation by totals for states and for the United States, showing the results of the inquiry relating to the shoddy manufacture.

TABLE 1.—COMPARATIVE STATEMENT OF WOOL MANUFACTURE FOR THE UNITED

(EXCLUDING HOSIERY

	STATES AND TERRITORIES.	Number of establishments. (b)	Capital. (c)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					MACHINERY.	
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.	Cards.	Combing machines.
				Average number.	Total wages.					
	United States:									
1	1840	1,420	$15,765,124	21,342		21,342				
2	1850 (d)	1,675	31,971,631	45,438		26,559	18,879			
3	1860 (e)	1,476	38,814,422	50,419	$11,699,630	29,852	20,567		3,319	
4	1870	3,208	121,451,059	105,071	35,928,150	53,400	39,150	12,521	8,705	261
5	1880	2,330	143,512,278	132,672	40,687,612	67,042	49,107	15,623	6,989	515
6	1890	1,693	e245,886,743	157,923	58,397,470	82,080	65,066	10,777	7,015	869
	New England states:									
7	1840	480	9,259,935	11,268		11,268				
8	1850	482	17,667,892	22,520		11,980	10,540			
9	1860	420	24,700,353	30,130	7,032,555	16,993	13,137		1,774	
10	1870	675	63,856,145	54,851	19,588,984	26,462	22,605	5,784	3,471	225
11	1880	564	75,522,666	67,582	21,390,036	34,939	25,712	6,931	3,396	302
12	1890	518	134,627,725	79,063	30,027,697	43,599	31,178	4,286	3,762	519
	Maine:									
13	1840	24	316,105	532		532				
14	1850	36	467,600	624		310	314			
15	1860	28	940,400	1,064	273,596	585	499		80	
16	1870	108	4,187,745	3,104	1,065,151	1,592	1,287	225	335	
17	1880	96	4,016,328	3,244	1,090,528	1,810	1,140	294	274	
18	1890	78	9,456,830	5,193	1,961,511	3,285	1,758	150	387	5
	New Hampshire:									
19	1840	66	740,345	893		893				
20	1850	61	2,437,700	2,127		926	1,201			
21	1860	54	2,647,300	2,655	687,746	1,291	1,364		204	
22	1870	82	5,626,100	5,061	1,788,894	2,259	2,328	494	360	12
23	1880	61	7,150,855	5,599	1,701,619	2,811	2,284	504	317	21
24	1890	52	12,015,721	6,222	2,352,565	3,276	2,762	184	380	29
	Vermont:									
25	1840	95	1,406,950	1,450		1,450				
26	1850	72	896,300	1,393		683	710			
27	1860	46	1,746,300	2,073	214,572	895	1,178		99	
28	1870	66	2,330,900	1,895	649,628	935	759	201	177	
29	1880	44	2,320,161	2,084	544,138	1,171	783	130	145	
30	1890	29	3,304,382	1,585	625,440	947	601	37	120	
	Massachusetts:									
31	1840	144	4,179,850	5,076		5,076				
32	1850	119	9,089,342	11,130		6,167	4,963			
33	1860	147	13,005,853	15,638	3,658,589	8,964	6,674		873	
34	1870	226	26,722,900	28,025	9,809,718	13,228	11,961	2,836	1,433	172
35	1880	214	36,764,000	34,717	11,027,822	17,588	14,060	3,069	1,622	190
36	1890	219	66,568,586	38,363	14,658,774	21,231	15,420	1,712	1,785	265
	Rhode Island:									
37	1840	41	685,350	961		961				
38	1850	45	1,013,000	1,758		987	771			
39	1860	58	3,100,000	4,232	1,069,728	2,594	1,638		253	
40	1870	76	10,467,500	7,894	2,862,492	3,644	3,184	1,066	484	7
41	1880	61	13,016,116	12,125	3,703,257	5,871	4,387	1,867	495	70
42	1890	69	24,210,743	17,787	6,561,759	8,946	7,114	1,727	358	193
	Connecticut:									
43	1840	119	1,931,335	2,356		2,356				
44	1850	149	3,773,950	5,488		2,907	2,581			
45	1860	87	3,191,500	4,468	1,128,324	2,684	1,784		265	
46	1870	117	14,521,000	8,852	3,413,101	4,804	3,086	962	682	34
47	1880	88	12,255,206	9,813	3,322,672	5,688	3,058	1,067	543	21
48	1890	71	18,971,463	9,913	3,867,648	5,914	3,523	476	532	27
	Middle states:									
49	1840	620	5,519,175	8,464		8,464				
50	1850	717	8,351,908	13,802		8,549	5,253			
51	1860	659	10,472,728	16,121	3,717,095	9,928	6,193		920	
52	1870	1,024	37,194,990	36,322	12,619,089	18,182	13,028	5,112	2,558	36
53	1880	794	53,834,368	54,138	16,682,073	26,797	20,144	7,197	2,154	210
54	1890	652	86,140,259	63,757	23,929,322	30,938	27,472	5,347	2,203	301
	New York:									
55	1840	323	3,469,349	4,636		4,636				
56	1850	249	4,459,370	6,674		4,262	2,412			
57	1860	168	4,133,568	6,123	1,351,955	3,475	2,648		324	
58	1870	272	14,451,232	12,487	4,315,710	6,199	4,583	1,705	940	1
59	1880	189	18,248,698	16,428	5,189,180	7,405	6,931	2,092	830	89
60	1890	138	26,853,583	17,693	6,596,593	8,167	8,217	1,309	702	84
	New Jersey:									
61	1840	31	314,650	427		427				
62	1850	41	494,274	898		411	487			
63	1860	45	646,200	986	226,788	608	378		61	
64	1870	36	1,524,200	1,522	493,054	709	552	261	98	6
65	1880	37	2,991,125	4,072	1,152,754	2,287	1,118	667	161	9
66	1890	35	6,441,571	5,971	2,073,771	2,965	2,787	219	202	20

a The comparative statement of hosiery and knit goods manufacture is given on pages 80 to 85.

b The number of establishments affords no clew to the growth or condition of the industry of wool manufacturing. This is due to the fact that in all censuses of the industry (except that of 1860) the custom carding mill has been counted as a wool factory, although it is not, in the modern use of the term, a factory, and ought not therefore to be included with the statistics of factory manufacture. The present census has made such an elimination possible hereafter by a distinct statement (Table 15) of the statistics of custom carding mills.

STATES, BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890.

AND KNIT GOODS.) (a)

MACHINERY—cont'd.			PRINCIPAL RAW MATERIALS—QUANTITIES CONSUMED.							
			Wool.							
Looms.	Spindles.	Cost of materials used.	Total. (Pounds.)	Foreign. (Pounds.)	Domestic. (Pounds.)	Hair, noils, etc. (Pounds.)	Cotton. (Pounds.)	Shoddy. (Pounds.)	Value of products.	
									$20,696,999	1
		$28,831,583	70,862,820						48,608,779	2
16,075	639,700	43,447,048	95,452,159				17,248,061		73,454,000	3
45,737	2,046,113	124,318,792	214,373,219	46,288,805	168,084,414		26,420,626	19,384,404	190,257,262	4
57,297	2,111,973	149,160,600	287,597,334	72,751,940	214,845,394	8,011,037	63,830,664	50,640,603	238,085,686	5
69,658	2,793,147	167,233,987	351,158,020	111,382,308	239,775,712	26,262,316	94,372,267	56,826,475	270,527,511	6
									12,959,486	7
		16,055,233	43,118,059						26,077,812	8
8,920	393,333	29,570,028	67,702,407				11,883,078		47,722,814	9
21,865	1,206,717	68,819,733	123,791,815	30,295,579	93,496,236		11,479,564	10,917,494	108,295,425	10
30,692	1,246,100	80,152,160	163,763,773	43,475,554	120,288,219	2,441,485	26,775,273	28,653,694	130,014,752	11
33,348	1,570,097	86,887,689	195,867,736	58,429,807	137,437,929	9,366,220	30,833,876	35,721,895	139,302,134	12
									412,366	13
		495,940	1,438,434						753,300	14
185	11,765	1,035,876	2,454,300				82,500		1,759,007	15
1,161	66,649	4,013,759	7,721,228	382,727	7,338,501		769,363		6,483,881	16
1,103	68,192	4,443,190	9,074,011	1,085,606	7,988,405	402,707	1,576,462	1,302,789	6,959,003	17
2,020	126,418	5,675,347	13,782,749	1,744,381	12,038,368	1,346,818	2,639,862	1,515,035	8,737,653	18
									795,784	19
		1,267,329	3,604,103						2,127,745	20
646	36,320	2,775,026	5,505,106				861,000		4,358,713	21
1,695	125,079	6,569,028	11,832,666	1,968,869	9,863,797		1,670,994	1,389,000	10,513,226	22
2,864	138,223	6,605,355	15,172,837	2,379,575	12,793,262	50,362	2,871,944	3,115,890	10,858,071	23
4,049	136,648	7,024,461	18,696,016	4,854,212	13,841,804	150,056	4,308,465	3,424,970	10,963,250	24
									1,331,953	25
		830,684	2,328,100						1,579,161	26
463	23,371	1,662,650	4,047,010				279,500		2,938,620	27
670	49,255	1,955,972	4,611,347	1,120,680	3,490,667		77,800	225,967	3,644,459	28
746	46,264	2,012,450	3,603,191	161,404	3,441,787	7,598	640,470	2,286,150	3,217,807	29
682	41,839	1,435,163	3,940,070	1,279,250	2,660,820	8,650	659,601	1,562,221	2,723,683	30
									7,082,898	31
		8,671,671	22,229,952						12,770,565	32
4,237	159,651	15,367,378	39,731,072				5,871,370		24,015,443	33
11,662	567,611	33,795,994	63,499,752	20,189,746	43,310,006		5,056,357	5,994,110	52,270,608	34
15,863	588,941	40,283,171	84,929,798	28,011,595	56,918,203	1,751,208	13,704,566	13,017,085	64,968,209	35
16,349	739,952	42,273,379	97,757,379	34,930,030	62,827,349	6,770,990	15,160,584	21,608,371	67,590,321	36
									842,172	37
		1,463,900	4,103,370						2,381,825	38
1,586	86,048	4,071,464	6,835,100				3,656,200		6,917,705	39
3,363	215,973	9,826,158	14,421,967	772,247	13,649,720		1,697,139	919,000	15,394,067	40
6,957	228,262	13,079,812	27,141,974	4,469,088	22,672,886	166,893	4,783,289	2,027,782	21,588,204	41
6,648	340,326	19,976,686	39,973,992	8,929,242	31,044,750	317,184	4,095,989	2,168,503	32,205,829	42
									2,494,313	43
		3,325,709	9,414,100						6,465,216	44
1,753	76,178	4,057,634	9,129,810				1,732,508		7,733,320	45
4,294	182,150	12,658,822	21,704,855	5,861,310	15,843,545		2,207,911	2,398,417	19,989,184	46
3,159	176,218	13,728,142	23,841,962	7,368,286	16,473,676	62,717	3,198,542	6,903,998	22,423,458	47
3,640	184,914	10,503,253	21,717,530	6,692,692	15,024,838	772,522	3,960,375	5,442,795	17,072,398	48
									6,637,708	49
		8,040,747	22,437,754						14,065,456	50
6,472	210,054	10,938,446	18,910,319				4,943,183		20,386,330	51
18,201	554,247	41,941,018	61,166,252	15,834,201	45,332,051		13,321,576	8,457,123	68,467,540	52
22,246	638,484	57,908,066	95,389,023	28,976,386	66,412,637	5,463,552	33,857,475	20,951,183	91,136,451	53
29,082	914,999	68,103,765	118,634,796	50,706,698	67,928,098	16,823,593	54,972,659	18,913,964	110,911,526	54
									3,537,337	55
		3,838,292	12,538,786						7,030,604	56
1,646	87,887	4,311,116	8,535,498				193,683		7,498,077	57
3,860	166,260	11,676,379	25,518,652	9,305,779	16,212,873		1,186,659	452,190	19,609,021	58
3,670	198,420	14,478,735	29,987,847	13,495,159	16,492,688	1,394,947	4,434,013	2,166,471	25,078,747	59
5,025	344,847	16,759,138	35,305,909	21,345,999	13,959,970	2,074,631	7,781,739	1,617,481	28,563,569	60
									440,710	61
		548,367	1,510,289						1,164,446	62
270	10,361	596,895	1,443,800				239,500		1,197,604	63
776	26,769	1,618,753	2,856,525	480,347	2,376,178		407,398	27,000	2,616,461	64
1,285	35,791	3,858,992	6,990,378	655,001	6,335,377	1,107,749	1,559,502	2,676,856	5,967,893	65
1,533	77,069	5,450,490	12,524,210	1,348,047	11,176,163	490,110	2,625,882	2,927,640	8,893,237	66

c Value of hired property is not included in the capital reported in 1890, because it was not included in the reports of previous census years.

d The details of the carpet industry were not given by states in 1850. The totals, however, have been added to the "Total for the United States" in this table, the figures being as follows: establishments, 116; capital, $3,852,981; number of employés, 6,186; cost of materials used, $3,075,592, and value of products, $5,401,231.

e Carding mills were not included in the report of the woolen industry of 1860, and are therefore not included in the figures for that year in the above table. There were 712 of these establishments, with a total capital of $1,080,985, employing 1,276 hands, at a cost of $286,267. They received 5,230,651 pounds of wool and produced 5,091,196 pounds of wool rolls, valued at $2,403,513.

TABLE 1.—COMPARATIVE STATEMENT OF WOOL MANUFACTURE FOR THE UNITED STATES, (EXCLUDING HOSIERY

	STATES AND TERRITORIES.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					MACHINERY.	
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.	Cards.	Combing machines.
				Average number.	Total wages.					
	Pennsylvania:									
1	1840	235	$1,510,546	2,930		2,930				
2	1850	380	3,005,054	5,726		3,490	2,236			
3	1860	407	5,211,510	8,484	$2,016,384	5,488	2,996		483	
4	1870	672	20,615,413	21,573	7,607,489	10,831	7,714	3,028	1,429	29
5	1880	548	31,898,226	32,989	10,162,244	16,688	11,936	4,365	1,120	121
6	1890	467	52,021,256	39,413	15,031,632	19,463	16,238	3,712	1,254	188
	Delaware:									
7	1840	2	107,000	83		83				
8	1850	8	148,500	140		122	18			
9	1860	4	117,000	114	27,564	76	38		8	
10	1870	11	384,500	399	115,137	186	110	103	30	
11	1880	5	352,559	261	108,504	171	59	31	13	
12	1890	3	450,974	297	103,395	146	112	39	15	
	Maryland: (a)									
13	1840	29	117,630	388		388				
14	1850	38	244,000	362		262	100			
15	1860	35	364,450	414	94,404	281	133		44	
16	1870	32	215,245	339	87,099	255	69	15	61	
17	1880	15	343,760	388	69,391	246	100	42	30	
18	1890	9	372,875	383	123,931	197	118	68	30	
	District of Columbia: (a)									
19	1840									
20	1850	1	700	2		2				
21	1860									
22	1870	1	4,400	2	600	2				
23	1880									
24	1890									
	Southern states:									
25	1840	115	304,650	488		488				
26	1850	155	747,360	1,119		808	311			
27	1860	115	1,744,100	2,205	418,368	1,429	776		232	
28	1870	589	3,327,952	2,888	575,529	1,831	669	388	908	
29	1880	447	2,994,517	2,645	493,634	1,498	745	402	540	
30	1890 (b)	222	7,894,776	5,717	1,564,846	2,620	2,429	668	385	4
	Virginia:									
31	1840	41	112,350	222		222				
32	1850	121	392,640	668		478	190			
33	1860	45	463,600	494	106,692	381	113		50	
34	1870	68	435,375	278	58,765	190	56	32	116	
35	1880	48	456,750	365	71,720	251	85	19	54	
36	1890	35	845,221	444	117,023	293	120	31	54	
	North Carolina:									
37	1840	3	9,800	4		4				
38	1850	1	18,000	30		15	15			
39	1860	7	223,000	253	60,036	113	140		23	
40	1870	52	237,800	249	39,101	151	81	17	78	
41	1880	49	203,100	185	23,195	120	50	15	57	
42	1890	27	339,068	324	65,329	170	125	29	35	
	South Carolina:									
43	1840	3	4,300	6		6				
44	1850									
45	1860	1	50,000	92	11,400	37	55		10	
46	1870	15	25,900	53	3,815	32	13	8	25	
47	1880	11	7,900	13	1,173	13			11	
48	1890 (b)									
	Georgia:									
49	1840	1	2,000	10		10				
50	1850	3	68,000	78		40	38			
51	1860	11	242,500	383	61,348	167	216		30	
52	1870	46	936,585	563	122,138	251	191	121	72	
53	1880	32	180,733	142	25,070	72	45	25	42	
54	1890	14	298,539	179	32,401	81	71	27	20	
	Alabama:									
55	1840									
56	1850									
57	1860	6	140,000	198	34,116	95	103		14	
58	1870	14	22,375	41	4,881	38	1	2	24	
59	1880	14	28,900	18	3,037	13	5		15	
60	1890	6	18,325	16	3,125	11	5		6	
	Texas:									
61	1840									
62	1850	1	8,000	8		4	4			
63	1860	2	60,000	43	7,680	36	7		4	
64	1870	20	97,250	100	20,278	80	16	4	29	
65	1880	1	97,500	36	25,700	28	8		2	
66	1890	4	371,270	359	138,795	142	176	41	9	
	Mississippi:									
67	1840									
68	1850									
69	1860	4	75,500	235	22,620	202	33		13	
70	1870	11	195,250	116	28,800	34	31	51	17	
71	1880	8	331,500	218	53,100	111	61	46	15	
72	1890	7	1,553,455	1,082	306,279	415	443	224	31	

a Maryland and the District of Columbia are classed in this table as middle states for purposes of comparison

BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890—Continued.

AND KNIT GOODS.)

MACHINERY—cont'd.			PRINCIPAL RAW MATERIALS—QUANTITIES CONSUMED.							
			Wool.							
Looms.	Spindles.	Cost of materials used.	Total (Pounds.)	Foreign. (Pounds.)	Domestic. (Pounds.)	Hair, noils, etc. (Pounds.)	Cotton. (Pounds.)	Shoddy. (Pounds.)	Value of products.	
									$2,319,061	1
		$3,282,718	7,560,379						5,321,866	2
4,334	108,326	5,674,197	7,703,249				4,337,000		10,901,767	3
11,265	340,114	28,010,301	31,723,147	6,014,170	25,708,977		11,504,634	7,879,203	45,221,795	4
16,780	393,387	38,740,330	56,751,365	14,623,020	42,128,345	2,940,522	27,771,271	15,463,876	58,886,250	5
22,101	474,618	45,173,677	69,387,219	27,877,283	41,509,936	14,258,852	44,218,488	14,232,953	72,393,182	6
									104,700	7
		204,172	393,000						251,000	8
76	1,000	75,807	140,000				100,000		153,035	9
227	8,756	392,614	546,187	12,455	533,732		185,000	96,930	576,067	10
125	4,306	448,285	836,883	203,206	633,677	20,084	55,100	346,778	665,253	11
129	7,306	295,605	531,198	35,369	495,829		314,500	95,890	482,022	12
									235,900	13
		165,568	430,300						295,140	14
66	2,480	280,431	1,087,772				73,000		635,757	15
167	12,348	241,224	521,741	21,450	500,291		37,885	1,000	441,596	16
136	6,580	381,724	822,550		822,550	250	37,589	297,200	538,308	17
114	11,150	424,855	886,200	100,000	786,200		32,050	40,000	579,516	18
										19
		1,030	5,000						2,400	20
										21
		1,747							2,600	22
										23
										24
									321,357	25
		750,203	2,448,026						1,298,642	26
296	16,544	1,634,730	5,042,682				421,800		2,840,550	27
1,022	50,311	2,715,827	5,912,589	1,200	5,911,389		616,459	2,762	4,278,311	28
1,315	47,989	2,736,023	6,021,980	85,000	5,936,980	500	1,455,408	279,647	3,958,571	29
3,788	106,541	4,000,966	8,730,576	357,790	8,372,786	61,741	5,395,513	1,188,847	6,700,545	30
									147,792	31
		488,899	1,554,110						841,013	32
121	7,574	389,204	1,131,000				10,000		717,827	33
137	6,236	317,800	742,200	1,200	741,000		27,260		488,352	34
154	8,486	383,080	862,812	5,000	857,812	500	104,170	60,500	577,968	35
212	12,382	375,175	975,745	25,367	950,378	1,500	105,112	88,585	609,809	36
									3,900	37
		13,950	30,000						23,750	38
29	1,000	151,005	504,500						291,000	39
97	2,806	166,497	435,600		355,693		10,000		208,038	40
80	2,374	255,707	576,145	80,000	496,145		118,464	12,444	303,160	41
169	10,990	198,358	449,260	50,760	398,500	40,374	282,860	40,000	308,946	42
									1,000	43
										44
		60,000	250,000						80,000	45
9	350	22,238	55,696		55,696		1,300	700	34,459	46
		19,455	48,950		48,950				24,075	47
										48
									3,000	49
		30,392	153,816						88,750	50
29	1,480	260,475	1,008,600				142,500		464,420	51
395	14,465	268,176	620,937		620,937		165,000		471,523	52
88	2,224	165,065	366,274		366,274		134,418		239,390	53
119	3,552	95,999	208,992	32,000	176,992	19,867	87,815	10,000	173,245	54
										55
										56
20	1,000	80,790	264,435				5,000		191,474	57
2	530	57,338	196,500		196,500		2,000		89,998	58
10	160	49,361	135,366		135,366		10,000		63,745	59
12	288	10,997	10,569		10,569		7,500	20,000	17,150	60
										61
		10,000	30,000						15,000	62
		25,980	81,900				18,000		38,796	63
30	1,070	86,817	278,045		278,045				152,968	64
12	600	44,435	175,000		175,000				80,500	65
135	1,900	185,607	572,400		572,400		103,000	1,000	359,230	66
										67
										68
21	1,000	119,849	270,597				75,600		158,507	69
30	344	79,566	154,790		154,790		32,700		147,323	70
121	3,734	211,646	494,033		494,033		205,896		299,605	71
276	9,196	508,039	1,565,824		1,565,824		416,000	36,000	924,185	72

[a] Includes reports from 2 establishments located (1) in Florida and (1) South Carolina. These establishments are not shown separately, in order that the operations of individual establishments may not be disclosed.

TABLE 1.—COMPARATIVE STATEMENT OF WOOL MANUFACTURE FOR THE UNITED STATES,

(EXCLUDING HOSIERY

	STATES AND TERRITORIES.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					MACHINERY.	
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.	Cards.	Combing machines.
				Average number.	Total wages.					
	Arkansas:									
1	1840	1	$12,600	1		1				
2	1850									
3	1860									
4	1870	13	32,500	31	$6,870	29	2		17	
5	1880	25	85,550	90	13,226	62	21	7	29	
6	1890	6	27,435	31	6,231	16	12	3	7	
	Tennessee:									
7	1840	26	25,600	45		45				
8	1850	4	10,900	17		15	2			
9	1860	1	6,000	10	2,472	8	2		1	
10	1870	148	373,868	428	62,780	342	61	25	177	
11	1880	106	418,664	402	67,065	249	111	42	98	
12	1890	49	1,393,679	998	239,657	428	446	124	80	
	Florida:									
13	1840									
14	1850									
15	1860									
16	1870	1	500	1		1			1	
17	1880									
18	1890 (a)									
	Louisiana:									
19	1840									
20	1850									
21	1860	1	75,000	60	6,720	40	20		4	
22	1870	2	34,000	29	8,900	22	3	4	12	
23	1880									
24	1890									
	West Virginia:									
25	1840									
26	1850									
27	1860									
28	1870	74	236,100	316	59,828	207	79	30	122	
29	1880	55	293,170	353	44,161	226	96	31	72	
30	1890	30	336,281	287	61,919	171	105	11	41	
	Kentucky:									
31	1840	40	138,000	200		200				
32	1850	25	249,820	318		256	62			
33	1860	37	408,500	437	103,284	350	87		83	
34	1870	125	700,449	683	159,373	454	137	92	208	
35	1880	98	890,750	823	166,189	353	253	217	154	
36	1890	42	2,705,683	1,994	593,305	890	926	178	100	4
	Western states:									
37	1840	196	681,364	1,122		1,122				
38	1850	205	1,351,490	1,811		1,341	470			
39	1860	280	1,727,241	1,873	481,812	1,435	438		383	
40	1870	906	14,897,772	10,172	2,802,135	6,212	2,809	1,151	1,701	
41	1880	505	8,877,427	7,227	1,697,463	3,816	2,357	1,054	807	3
42	1890	287	13,254,918	7,720	2,412,634	3,756	3,535	429	574	15
	Ohio:									
43	1840	130	537,985	935		935				
44	1850	130	870,220	1,201		903	298			
45	1860	122	662,000	753	185,268	567	186		173	
46	1870	225	3,066,969	2,329	574,164	1,351	710	268	334	
47	1880	123	1,383,340	1,432	279,614	773	445	214	182	2
48	1890	69	2,479,872	1,431	449,026	686	591	154	104	5
	Indiana:									
49	1840	37	77,954	103		103				
50	1850	33	171,545	246		189	57			
51	1860	79	464,341	533	150,276	436	97		112	
52	1870	175	3,821,913	2,469	726,113	1,450	711	308	346	
53	1880	81	2,273,705	1,741	462,681	846	587	308	160	1
54	1890	46	2,969,356	2,147	609,868	911	1,124	112	135	4
	Illinois:									
55	1840	16	26,205	34		34				
56	1850	16	154,500	178		124	54			
57	1860	25	210,100	166	45,180	132	34		37	
58	1870	109	2,962,443	1,736	535,185	1,040	468	228	250	
59	1880	53	1,327,553	1,042	296,225	527	365	150	106	
60	1890	23	1,649,918	914	313,780	482	405	27	57	
	Michigan:									
61	1840	4	34,120	37		37				
62	1850	15	94,000	129		78	51			
63	1860	16	103,950	126	30,672	77	49		14	
64	1870	54	1,011,050	667	202,813	408	208	51	116	
65	1880	39	558,800	347	76,240	203	114	30	51	
66	1890	33	998,087	580	181,803	326	223	31	54	
	Wisconsin:									
67	1840									
68	1850	9	31,225	25		25				
69	1860	15	100,600	105	27,036	74	31		19	
70	1870	67	1,247,389	802	230,706	519	211	72	135	
71	1880	48	1,349,954	847	214,993	426	378	43	75	
72	1890	33	2,496,377	1,087	360,739	521	555	11	63	6

a See note b on page 75.

BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890—Continued.

AND KNIT GOODS.)

MACHINERY—cont'd.			PRINCIPAL RAW MATERIALS—QUANTITIES CONSUMED.							
			Wool.							
Looms.	Spindles.	Cost of materials used.	Total. (Pounds.)	Foreign. (Pounds.)	Domestic. (Pounds.)	Hair, noils, etc. (Pounds.)	Cotton. (Pounds.)	Shoddy. (Pounds.)	Value of products.	
									$129	1
										2
										3
		$55,782	115,330		115,330				78,600	4
41	1,360	85,972	189,000		189,000		30,600	300	127,430	5
24	735	28,030	67,500		67,500		5,550		38,360	6
									14,290	7
		1,675	6,200						6,310	8
	500	5,225	10,000						8,100	9
80	3,614	503,737	1,030,153		1,030,153		101,449	2,062	696,844	10
167	6,860	423,054	883,338		883,338		180,416	55,433	620,724	11
925	19,938	760,036	1,448,486	187,625	1,260,861		1,462,967	197,690	1,216,419	12
										13
										14
										15
		150	550		550				500	16
										17
										18
										19
										20
		31,300	69,150						45,230	21
140	4,000	19,047	50,325		50,325		1,500		30,795	22
										23
										24
										25
										26
										27
120	6,387	307,051	673,003		673,003				475,763	28
179	8,081	245,843	602,399		602,399		4,000	33,819	356,986	29
153	7,164	202,801	600,823	5,001	595,822		31,209	9,632	328,800	30
									151,246	31
		205,287	673,900						318,819	32
94	3,990	510,902	1,452,500				170,700		845,226	33
222	10,509	831,628	1,639,367		1,639,367		275,250		1,312,458	34
513	14,110	852,405	1,688,663		1,688,663		667,444	117,151	1,264,988	35
1,661	40,346	1,631,860	2,828,377	57,037	2,771,340		2,892,500	785,940	2,721,968	36
									778,448	37
		909,808	2,858,990						1,770,635	38
382	18,989	1,226,844	3,246,751						2,269,306	39
3,944	226,638	10,006,478	20,631,163	157,825	20,473,338		903,027	5,225	16,607,375	40
2,786	156,012	7,087,326	17,702,458	195,000	17,507,458	80,500	1,508,482	660,989	10,722,024	41
3,133	176,869	7,125,149	22,859,293	1,743,013	21,116,280	10,762	2,956,355	943,658	11,673,341	42
									685,757	43
		578,423	1,657,726						1,111,027	44
96	5,827	482,994	1,190,751						843,516	45
1,052	52,780	2,119,869	3,972,234	62,200	3,910,034		175,464		3,467,699	46
638	35,200	1,153,929	2,695,424	165,000	2,530,424	80,000	310,824	134,063	1,779,439	47
712	32,263	1,398,892	3,500,244	474,764	3,025,480	3,900	357,152	199,080	2,280,002	48
									58,867	49
		120,486	413,350						205,802	50
177	8,266	352,362	940,000						649,771	51
1,140	57,083	2,684,315	5,029,618	80,157	4,949,461		513,595		4,329,711	52
814	36,886	1,823,390	4,360,456	10,000	4,350,456		831,776	345,656	2,729,347	53
1,006	46,690	1,880,515	6,324,884	632,833	5,692,051	600	1,961,374	154,303	3,036,682	54
									9,540	55
		115,367	398,964						206,572	56
20	1,000	112,097	327,800						193,388	57
653	36,888	1,701,323	3,560,829		3,560,829		151,650		2,849,249	58
374	20,992	1,332,798	3,003,740		3,003,740		114,531	83,107	1,896,460	59
323	18,745	789,310	2,566,621	59,000	2,507,621		319,179	67,253	1,299,506	60
									9,734	61
		43,402	162,250						90,242	62
20	1,000	69,010	163,100						139,246	63
232	15,650	659,700	1,391,889		1,391,889		3,550		1,204,868	64
167	10,688	356,614	869,025		869,025		5,310	37,163	481,517	65
158	13,559	603,374	2,033,321	408,026	1,625,295		2,440	269,148	988,652	66
										67
		32,630	134,200						87,992	68
20	1,000	85,743	265,000						172,720	69
226	16,445	688,193	1,642,637	15,468	1,627,169		500		1,258,417	70
229	16,389	892,793	2,066,188		2,066,188	500	50,955	35,235	1,480,069	71
236	24,802	1,117,013	3,125,572	164,090	2,961,482	6,262	111,323	198,274	1,844,364	72

TABLE 1.—COMPARATIVE STATEMENT OF WOOL MANUFACTURE FOR THE UNITED STATES, (EXCLUDING HOSIERY

	STATES AND TERRITORIES.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					MACHINERY.	
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.	Cards.	Combing machines.
				Average number.	Total wages.					
	Iowa:									
1	1840									
2	1850	1	$10,000	7		7				
3	1860	12	82,500	120	$23,652	96	24		13	
4	1870	85	1,440,484	1,088	269,432	685	293	110	199	
5	1880	34	553,500	499	117,792	307	132	60	56	
6	1890	14	694,600	378	133,240	186	176	16	36	
	Missouri:									
7	1840	9	5,100	13		13				
8	1850	1	20,000	25		15	10			
9	1860	11	103,750	70	19,728	53	17		15	
10	1870	156	716,524	718	137,408	548	85	85	258	
11	1880	98	726,150	689	109,877	412	144	133	126	
12	1890	35	729,616	510	122,410	261	190	59	52	
	Kansas:									
13	1840									
14	1850									
15	1860									
16	1870	9	96,000	91	30,682	56	24	11	24	
17	1880	5	131,925	124	25,825	66	40	18	9	
18	1890 (a)									
	Minnesota:									
19	1840									
20	1850									
21	1860									
22	1870	10	246,600	146	45,592	77	60	9	19	
23	1880	13	190,500	229	46,108	106	73	50	21	
24	1890	21	563,771	341	120,967	193	147	1	37	
	Utah:									
25	1840									
26	1850									
27	1860									
28	1870	15	223,400	106	48,040	58	39	9	19	
29	1880	11	382,000	277	68,108	150	79	48	21	
30	1890	9	579,209	274	104,156	165	95	14	31	
	New Mexico:									
31	1840									
32	1850									
33	1860									
34	1870	1	65,000	20	2,000	20			1	
35	1880									
36	1890									
	All other western states: (a)									
37	1890	4	103,112	58	16,645	25	29	4	5	
	Pacific states:									
38	1840									
39	1850									
40	1860	2	170,000	90	[illegible]	67	23		10	
41	1870	14	2,174,200	838	[illegible]	713	39	86	67	
42	1880	20	2,283,300	1,080	424,[illegible]	892	149	39	83	
43	1890	14	3,989,065	1,666	462,971	1,167	452	47	91	
	California:									
44	1840									
45	1850									
46	1860	1	100,000	60	33,600	40	20		6	
47	1870	5	1,785,000	659	230,200	584	31	44	46	
48	1880	9	1,676,500	835	334,318	706	106	19	60	
49	1890	8	2,618,480	1,264	287,658	922	318	24	70	
	Oregon:									
50	1840									
51	1850									
52	1860	1	70,000	30	16,200	27	3		4	
53	1870	9	389,200	179	112,213	129	8	42	21	
54	1880	10	566,800	216	96,088	166	33	17	21	
55	1890	6	1,350,585	402	175,313	245	134	23	21	
	Washington:									
56	1840									
57	1850									
58	1860									
59	1870									
60	1880	1	40,000	29	4,000	18	8	3	2	
61	1890									

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Idaho, 1; Kansas, 1; South Dakota, 2.

BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890—Continued.

AND KNIT GOODS.)

MACHINERY—cont'd.		Cost of materials used.	PRINCIPAL RAW MATERIALS—QUANTITIES CONSUMED.						Value of products.	
			Wool.			Hair, noils, etc. (Pounds.)	Cotton. (Pounds.)	Shoddy. (Pounds.)		
Looms.	Spindles.		Total. (Pounds.)	Foreign. (Pounds.)	Domestic. (Pounds.)					
									$800	1
		$3,500	14,500						13,000	2
20	1,000	67,293	168,700						127,640	3
374	31,462	998,073	2,273,428		2,273,428		23,148	1,225	1,647,606	4
166	11,025	435,747	1,407,510		1,407,510		18,597	865	679,904	5
158	10,828	505,503	1,880,532	300	1,880,232		10,610	46,000	695,218	6
									13,750	7
		16,000	80,000						56,000	8
29	896	56,745	191,400						143,025	9
183	10,371	849,313	1,979,671		1,979,671		25,500		1,256,213	10
193	12,622	681,711	1,811,635		1,811,635		115,227	4,000	930,961	11
261	12,984	311,881	1,052,229	4,000	1,048,229		155,395	7,000	548,457	12
										13
										14
										15
29	1,616	86,105	200,000		200,000		1,300		153,150	16
41	2,636	107,251	364,000		364,000		23,200	2,000	211,525	17
										18
										19
										20
										21
39	2,664	108,540	254,857		254,857				219,862	22
79	3,852	155,867	557,580	20,000	537,580		6,365	18,000	253,378	23
125	7,510	309,378	1,358,290		1,358,290			4,000	539,995	24
										25
										26
										27
31	1,430	98,272	276,000		276,000		8,320		199,600	28
114	5,422	147,226	566,900		566,900		31,697	1,000	279,424	29
99	7,960	163,864	800,500		800,500		38,632		338,534	30
										31
										32
										33
5	240	12,775	50,000		50,000			4,000	21,000	34
										35
										36
53	1,528	45,419	217,100		217,100		250		101,931	37
										38
										39
45	780	77,000	550,000						235,000	40
273	8,200	835,736	2,871,400		2,871,400		100,000	1,800	1,608,611	41
2[illegible]	23,388	1,277,025	4,720,100	20,000	4,700,100	25,000	234,026	95,150	2,253,888	42
3[illegible]7	24,650	1,116,418	5,065,619	145,000	4,920,619		213,864	58,111	1,939,965	43
										44
										45
30	500	50,000	400,000						150,000	46
185	3,880	608,141	1,928,000		1,928,000		100,000	1,800	1,102,754	47
230	18,740	997,539	3,574,850	20,000	3,554,850	25,000	228,026	94,150	1,634,858	48
292	18,598	788,916	3,699,471	145,000	3,554,471		107,318	53,111	1,325,033	49
										50
										51
15	280	27,000	150,000						85,000	52
90	4,320	227,595	943,400		943,400				505,857	53
56	4,248	227,486	985,250		985,250		6,000	1,000	549,030	54
95	6,052	327,502	1,366,148		1,366,148		106,546	5,000	614,932	55
										56
										57
										58
										59
12	400	52,000	160,000		160,000				70,000	60
										61

TABLE 2.—COMPARATIVE STATEMENT OF HOSIERY AND KNIT GOODS MANUFACTURE FOR THE

	STATES AND TERRITORIES	Number of establishments.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. Capital.	Aggregates. Average number.	Total wages.	Males above 16 years.	Females above 15 years.	Children.	MACHINERY. Cards.	Combing machines.	Knitting machines.	Sewing machines.	Looms.	Spindles.
	United States:													
1	1840 (a)													
2	1850 (b)	85	$344,735	2,325	$360,346	835	1,490							
3	1860	197	4,035,510	9,103	1,661,972	2,780	6,323							
4	1870	248	10,931,260	14,788	4,429,085	4,252	7,991	2,545	519		5,625	1,668	438	148,285
5	1880	359	15,579,591	28,885	6,701,475	7,517	17,707	3,661	592	3	12,659	4,569	1,964	143,021
6	1890	796	c50,607,738	61,209	18,263,272	16,366	40,927	3,916	1,183	16	36,327		149	389,353
	New England states:													
7	1840													
8	1850													
9	1860	47	1,534,700	2,165	487,440	815	1,350							
10	1870	84	4,021,660	5,280	1,808,335	1,678	3,059	543	236		2,466	760	214	82,656
11	1880	103	5,156,306	7,818	1,918,715	2,130	4,969	719	207		2,626	816	1,085	46,047
12	1890	168	14,538,511	13,503	4,344,884	3,828	9,208	467	329	9	8,638		5	147,825
	Maine:													
13	1840													
14	1850													
15	1860													
16	1870													
17	1880	1	500	21	801	1	20							
18	1890	4	28,095	260	30,165	6	254				91			
	New Hampshire:													
19	1840													
20	1850													
21	1860	12	133,000	488	76,188	138	350							
22	1870	28	855,460	1,081	405,003	341	621	113	58		832	102	20	17,175
23	1880	24	1,224,000	1,753	536,117	540	1,098	115	68		932	118	147	17,500
24	1890	37	2,706,065	3,178	989,130	1,062	2,040	76	112		3,062			36,526
	Vermont:													
25	1840													
26	1850													
27	1860	2	21,500	93	15,792	30	63							
28	1870	7	503,000	331	90,179	89	216	26	23		49	53		26,300
29	1880	6	492,000	383	191,037	138	227	18	22		63	94		3,805
30	1890	10	754,882	718	269,844	275	438	5	37		221			9,584
	Massachusetts:													
31	1840													
32	1850													
33	1860	15	155,200	388	94,692	166	222							
34	1870	32	1,570,500	2,415	848,864	844	1,404	167	79		1,116	312	180	19,331
35	1880	57	1,467,375	3,411	608,067	786	2,413	212	38		813	257	545	9,028
36	1890	74	4,497,940	4,675	1,495,260	1,127	3,418	130	52		3,344		5	40,822
	Rhode Island:													
37	1840													
38	1850													
39	1860													
40	1870	3	133,000	120	33,200	37	64	19	6		33		5	1,800
41	1880	1	6,000	39	8,400	6	24	9			32	7	4	
42	1890	16	1,728,618	1,538	487,350	365	1,024	149	14	2	755			15,825
	Connecticut:													
43	1840													
44	1850													
45	1860	18	1,225,000	1,196	300,768	481	715							
46	1870	14	1,159,700	1,333	431,089	364	751	218	70		436	293	9	18,050
47	1880	14	1,966,431	2,211	664,293	659	1,187	365	79		720	340	389	15,674
48	1890	27	4,822,911	3,134	1,073,135	993	2,034	107	114	7	1,195			45,068
	Middle states:													
49	1840													
50	1850													
51	1860	134	2,476,210	6,888	1,160,624	1,928	4,960							
52	1870	141	6,873,300	9,365	2,596,360	2,524	4,843	1,998	282		3,091	906	213	65,717
53	1880	190	9,883,486	18,201	4,451,850	5,046	10,645	2,510	378	3	8,423	3,681	833	95,316
54	1890	460	30,231,762	37,823	11,574,128	10,908	24,138	2,777	779	7	20,838		121	213,023
	New York:													
55	1840													
56	1850													
57	1860	22	1,102,500	2,701	392,924	597	2,104							
58	1870	60	3,318,700	3,741	1,122,890	1,061	1,899	781	270		746	620	20	49,441
59	1880	75	5,334,876	7,858	2,036,076	2,389	4,470	999	320		1,311	1,953	103	71,008
60	1890	201	19,608,331	20,299	6,437,308	6,862	12,612	825	701	4	5,434		78	186,057
	New Jersey:													
61	1840													
62	1850													
63	1860	7	477,200	1,491	225,060	329	1,162							
64	1870	4	575,500	722	193,200	136	271	315	13		11	138	147	6,480
65	1880	8	804,570	1,070	239,761	320	604	146	23		343	75		6,048
66	1890	15	1,352,143	1,277	342,600	399	761	117	33		694			9,548
	Pennsylvania:													
67	1840													
68	1850													
69	1860	103	895,460	2,692	541,116	998	1,694							
70	1870	76	2,979,000	4,899	1,280,270	1,325	2,672	902	39		2,332	148	46	9,796
71	1880	106	3,743,790	9,372	2,175,913	2,337	5,570	1,365	35	3	8,769	1,653	730	18,260
72	1890	236	9,121,632	15,941	4,732,754	3,608	10,563	1,770	45	3	14,492		43	17,418

a Not separately reported.
b At the census of 1850 totals for the different states were not published, totals for the United States only being given.

UNITED STATES, BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890.

Cost of materials used.	PRINCIPAL RAW MATERIALS—QUANTITIES CONSUMED. Wool. Total. (Pounds.)	Wool. Foreign. (Pounds.)	Wool. Domestic. (Pounds.)	Merino yarn. (Pounds.)	Woolen yarn. (Pounds.)	Worsted yarn. (Pounds.)	Cotton, cotton warp, and yarn. (Pounds.)	Hair, noils, etc. (Pounds.)	Shoddy. (Pounds.)	Value of products.	
$415,113										$1,028,102	1
3,202,317	2,927,626						3,892,342			7,280,606	2
9,835,823	5,596,955	292,300	5,304,655		2,229,777		13,652,225		189,857	18,411,564	3
15,210,951	8,594,895	448,758	8,146,137	67,561	3,753,566	75[illegible],255	28,485,238	66,929	1,523,263	29,167,227	4
35,861,585	21,639,393	2,734,304	18,905,089		6,386,370	4,146,035	64,681,466	424,496	4,735,144	67,241,013	5
											6
											7
											8
1,092,358	1,457,266						1,693,001			2,374,242	9
3,282,123	2,483,733	141,500	2,342,233		315,419		4,033,943		10,000	6,910,797	10
4,034,873	4,348,024	209,440	4,138,584		674,986	106,201	3,977,864	26,779	366,843	7,912,916	11
8,661,685	8,398,486	1,035,183	7,363,253		869,432	1,020,615	12,214,509	128,525	1,081,598	16,034,801	12
											13
											14
											15
											16
1,800					2,000					3,000	17
33,839					29,075	12,320	6,000			76,603	18
											19
											20
338,075	362,120						398,280			573,794	21
841,646	880,750	40,500	840,250				946,235			1,757,445	22
1,249,600	1,756,332	76,000	1,680,332		96,500	2,500	1,102,284	5,000	186,900	2,362,779	23
1,777,585	3,456,174	243,850	3,212,324		96,658	106,478	841,739	4,200	960,998	3,481,922	24
											25
											26
61,840	130,000						50,000			102,800	27
191,219	146,289		146,289				384,789			551,129	28
359,938	401,333		401,333		1,200	500	406,539		2,525	595,270	29
649,004	576,669	66,000	510,669		2,000		666,448		16,882	1,105,958	30
											31
											32
132,075	196,080						148,000			314,120	33
1,515,326	904,900	25,000	879,900		249,356		1,849,994			3,213,481	34
1,394,748	1,068,684	7,266	1,081,418		502,511	88,619	857,700		8,000	2,483,596	35
2,552,705	1,812,076	52,989	1,759,087		456,440	278,853	4,466,465		44,500	5,682,087	36
											37
											38
											39
68,541	113,080		113,000				30,000			137,000	40
14,838					22,750					36,000	41
1,618,621	788,311	140,000	648,311		108,159	445,633	3,337,264		12,218	2,516,664	42
											43
											44
580,368	769,140						1,186,721			1,383,528	45
625,391	438,794	76,000	362,794		66,063		822,925		10,000	1,251,742	46
1,013,949	1,101,675	126,174	975,501		50,025	14,582	1,611,341	21,779	169,418	2,432,271	47
2,029,921	1,765,206	532,344	1,232,862		177,100	177,331	2,896,593	124,325	47,000	3,771,567	48
											49
											50
2,082,344	1,462,866						2,195,341			4,847,984	51
6,505,973	3,112,622	150,800	2,961,822		1,871,183		9,601,982		179,857	11,405,380	52
10,254,739	4,006,871	239,318	3,767,553	67,561	2,327,394	614,404	24,305,874	40,150	1,146,420	19,696,588	53
23,058,630	10,083,581	1,081,363	9,002,218		3,188,204	2,741,794	47,428,283	241,049	3,174,904	42,993,045	54
											55
											56
870,479	689,066						1,348,941			1,944,090	57
3,391,840	2,168,822	150,800	2,018,022		50,500		7,119,839		179,857	5,528,742	58
5,972,056	2,548,989	186,326	2,362,643		538,467	46,159	16,164,505	40,000	1,062,011	9,899,540	59
13,089,169	9,024,692	882,065	8,142,627		1,034,837	695,260	27,982,069	215,195	3,069,939	24,776,582	60
											61
											62
279,952	419,800						766,400			783,456	63
188,090	230,000		230,000		1,000		216,700			508,900	64
258,043	175,184	5,400	169,784		106,300	3,100	487,026	150	15,553	861,181	65
562,783	404,847	188,839	216,008		113,600	36,629	842,202	10,673	18,623	1,091,403	66
											67
											68
828,915	354,000						80,000			2,114,315	69
2,935,322	713,800		713,800		1,819,183		2,264,943			5,306,738	70
4,934,138	1,282,718	47,592	1,235,126	67,561	1,682,127	565,145	7,654,343		68,856	8,935,147	71
8,720,368	654,042	10,459	643,583		1,985,017	1,995,905	18,488,312	15,181	86,342	16,944,237	72

a Value of hired property is not included in the capital reported in 1890, because it was not included in the reports of previous census years.

TABLE 2.—COMPARATIVE STATEMENT OF HOSIERY AND KNIT GOODS MANUFACTURE FOR THE

	STATES AND TERRITORIES.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. Aggregates. Average number.	Total wages.	Males above 16 years.	Females above 15 years.	Children.	MACHINERY. Cards.	Combing machines.	Knitting machines.	Sewing machines.	Looms.	Spindles.
	Maryland: (a)													
1	1840													
2	1850													
3	1860	2	$1.050	4	$1,524	4								
4	1870	1	100	3		2	1				2			
5	1880	1	250	1	100		1							
6	1890	8	149,656	306	61,466	39	202	65			218			
	Western states:													
7	1840													
8	1850													
9	1860	13	21,900	46	12,228	33	13							
10	1870	23	36,300	143	24,390	50	89	4	1		68	2	11	12
11	1880	65	534,799	2,862	330,210	339	2,093	430	7		1,609	72	42	1,660
12	1890	146	5,190,366	8,369	2,031,200	1,389	6,687	293	60		6,056		5	22,152
	Ohio:													
13	1840													
14	1850													
15	1860	11	10,900	36	9,264	23	13							
16	1870	5	9,400	22	5,250	16	6				7		10	
17	1880	23	187,000	745	94,858	53	574	118			368	4	30	60
18	1890	44	1,071,007	1,898	466,630	168	1,655	75	8		1,574		5	2,456
	Indiana:													
19	1840													
20	1850													
21	1860													
22	1870	5	4,050	26	540	7	18	1			9	1		
23	1880	5	45,000	284	24,700	26	201	57			183	5		
24	1890	9	716,989	962	207,519	307	594	61	18		670			7,392
	Illinois:													
25	1840													
26	1850													
27	1860													
28	1870	3	1,800	27	1,800	4	21	2	1		19	1		12
29	1880	14	105,800	707	92,385	160	471	76	3		433	48	11	680
30	1890	35	1,254,576	1,878	545,109	349	1,483	46	14		1,525			5,824
	Michigan:													
31	1840													
32	1850													
33	1860													
34	1870													
35	1880	11	147,389	962	92,324	80	706	176	4		521	9		920
36	1890	10	560,917	848	208,344	163	684	1	14		678			3,680
	Wisconsin:													
37	1840													
38	1850													
39	1860													
40	1870													
41	1880	4	10,010	28	3,364	6	20	2			19	4		
42	1890	23	1,214,727	2,296	449,724	335	1,856	105	6		1,138			2,800
	Iowa:													
43	1840													
44	1850													
45	1860													
46	1870	2	5,200	6	1,200	3	3							
47	1880	3	2,200	6	460	3	3				7			
48	1890	3	8,950	9	2,550	3	6				14			
	Missouri:													
49	1840													
50	1850													
51	1860	2	11,000	10	2,964	10								
52	1870	7	15,700	61	15,600	19	41	1			33			
53	1880	4	29,400	118	19,300	3	114	1			68			
54	1890	7	33,247	125	34,477	7	118				145			
	Minnesota:													
55	1840													
56	1850													
57	1860													
58	1870	1	150	1		1							1	
59	1880	1	8,000	12	2,819	8	4				10	2	1	
60	1890	3	247,498	129	46,356	27	102				152			
	Utah:													
61	1840													
62	1850													
63	1860													
64	1870													
65	1880													
66	1890	5	33,370	70	17,020	5	60	5			73			
	All other western states: (b)													
67	1890	7	49,085	154	53,471	25	129				87			

a Maryland is classed in this table as a middle state for purposes of comparison.

UNITED STATES, BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890—Continued.

Cost of materials used.	PRINCIPAL RAW MATERIALS—QUANTITIES CONSUMED.								Value of products.	
	Wool.			Merino yarn. (Pounds.)	Woolen yarn. (Pounds.)	Worsted yarn. (Pounds.)	Cotton, cotton warp, and yarn. (Pounds.)	Hair, noils, etc. (Pounds.)	Shoddy. (Pounds.)	
	Total. (Pounds.)	Foreign. (Pounds.)	Domestic. (Pounds.)							
										1
										2
$2,998									$6,123	3
780					500		500		1,000	4
500					500				720	5
87,315					54,750	14,000	115,700		180,823	6
										7
										8
21,715	6,500						4,000		46,680	9
47,727	600		600		43,175		16,300		95,387	10
919,639	240,000		240,000		749,786	29,650	201,500	10,000	1,555,123	11
3,648,462	3,100,876	617,758	2,483,118		2,328,534	383,626	2,658,199	54,922	338,612	7,240,031	12
										13
										14
13,515	6,500						4,000			31,800	15
10,360					10,600					23,100	16
241,563					241,850	3,850	6,000			418,825	17
914,085	359,000	4,000	355,000		851,313	145,857	296,392		5,000	1,635,948	18
										19
										20
										21
2,842					2,575					5,450	22
103,280					76,300	5,200	30,000			158,200	23
408,195	1,095,253	568,758	526,495		74,098	3,342	292,826	25,762	143,572	827,104	24
										25
										26
										27
5,775	600		600		5,100		100			8,800	28
299,895	60,000		60,000		226,800	10,000	112,900			484,124	29
980,780	818,500		818,500		251,020	72,480	1,348,620	17,500	27,920	1,990,035	30
										31
										32
										33
										34
236,627	180,000		180,000		154,600	5,000	41,300		10,000	377,249	35
285,057	247,081	25,000	222,081		121,667	19,400	332,955		30,937	701,322	36
										37
										38
										39
										40
9,125					7,100	700				18,817	41
899,371	581,042	20,000	561,042		886,786	84,047	267,906	11,660	131,213	1,635,641	42
										43
										44
										45
1,510					300		600			2,887	46
1,554					1,536					2,908	47
1,975					1,275		3,000			5,763	48
										49
										50
8,200										14,880	51
27,040					24,400		15,600			54,650	52
41,575					36,660	4,500	11,300			85,000	53
30,524					30,325		37,500			81,445	54
										55
										56
										57
200					200					500	58
5,000					5,000	400				10,000	59
87,662					64,000	41,000	42,000			183,743	60
										61
										62
										63
										64
										65
25,475					31,375	2,500	500			53,560	66
47,338					16,675	15,000	36,500			125,470	67

a Includes states having less than 3 establishments in this branch of industry, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 2; Colorado, 2; Kansas, 1; Nebraska, 1; Washington, 1.

TABLE 2.—COMPARATIVE STATEMENT OF HOSIERY AND KNIT GOODS MANUFACTURE IN THE UNITED

	STATES.		Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					MACHINERY.				
					Aggregates		Males above 16 years.	Females above 15 years.	Children.	Cards.	Combing machines.	Knitting machines.	Looms.	Spindles.
					Average number.	Total wages.								
1	Southern states (a)	1860	3	$2,700	4	$1,680	4	.....	.....	.....	.....	.....	.....	.....
2		1880	1	5,000	4	700	2	.....	2	.....	.....	1	4	.....
3		1890	22	647,099	1,514	313,060	241	894	379	15	.....	795	18	6,353
4	Alabama	1890	3	94,373	412	64,838	25	137	250	2	.....	128	.....	.....
5	Georgia	1890	4	121,494	349	71,952	54	221	74	2	.....	225	.....	960
6	Kentucky	1860	3	2,700	4	1,680	4	.....	.....	.....	.....	.....	.....	.....
7	Louisiana	1890	3	106,600	284	51,841	26	258	.....	.....	.....	169	.....	1,800
8	North Carolina	1890	5	72,900	184	30,410	24	105	55	.....	.....	136	.....	512
9	West Virginia	1880	1	5,000	4	700	2	.....	2	.....	.....	1	4	.....
10	All other southern states (b)	1890	7	251,732	285	94,019	112	173	.....	11	.....	137	18	3,081

a With the exception of Kentucky and West Virginia, the states in this group did not manufacture hosiery and knit goods until 1890.

STATES, BY GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890—Continued.

Cost of materials used.	PRINCIPAL RAW MATERIALS—QUANTITIES CONSUMED.								Value of products.	
	Wool.			Merino yarn. (Pounds.)	Woolen yarn. (Pounds.)	Worsted yarn. (Pounds.)	Cotton, cotton warp, and yarn. (Pounds.)	Hair, noils, etc. (Pounds.)	Shoddy. (Pounds.)	
	Total. (Pounds.)	Foreign. (Pounds.)	Domestic. (Pounds.)							
$5,900	1,000									$11,700	1
1,700					1,400					2,600	2
459,808	56,500		56,500		200		2,380,475		140,000	973,136	3
103,883							545,400			190,725	4
70,697							486,340			166,850	5
5,900	1,000									11,700	6
58,202							420,000			151,180	7
66,925							277,000			126,875	8
1,700					1,400					2,600	9
160,091	56,500		56,500		200		651,735		140,000	337,506	10

b Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Florida, 1; Kentucky, 2; Virginia, 2; West Virginia, 2.

TABLE 3.—STATISTICS OF WOOL MANUFACTURE,

	STATES AND TERRITORIES.	Number of establishments.	CAPITAL.				AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.	
				Direct investment.		Miscellaneous expenses.	Aggregates.	
			Value of hired property.	Aggregate.	Land, buildings, and machinery.	Live assets.	Average number.	Total wages.
1	The United States	2,489	$17,320,780	$296,494,481	$129,721,571	$166,772,910	$19,249,508	219,132	$76,660,742
2	Alabama	9	400	112,698	76,473	36,225	3,841	428	67,963
3	Arkansas	6	.....	27,435	21,800	5,635	752	31	6,231
4	California	10	104,870	2,661,480	1,540,603	1,120,877	171,035	1,375	328,824
5	Connecticut	98	660,334	23,794,374	9,386,218	14,408,156	1,499,495	13,047	4,940,783
6	Delaware	3	.....	450,974	257,000	193,974	27,404	297	103,395
7	Georgia	18	.....	420,033	305,940	114,093	21,492	528	104,353
8	Illinois	58	337,000	2,904,494	1,103,072	1,801,422	178,282	2,792	858,889
9	Indiana	55	57,725	3,686,345	1,703,246	1,983,099	305,940	3,109	817,387
10	Iowa	17	18,000	703,550	301,800	401,750	40,469	387	135,790
11	Kentucky	44	120,700	2,766,683	1,335,527	1,431,156	186,443	2,042	615,055
12	Louisiana	4	12,900	110,000	77,100	32,900	2,726	286	52,517
13	Maine	82	89,400	9,484,925	3,956,686	5,528,239	594,324	5,453	1,991,676
14	Maryland	17	8,600	522,531	285,099	237,432	24,189	689	185,397
15	Massachusetts	293	3,415,001	71,066,526	28,378,202	42,688,324	4,900,703	43,038	16,154,034
16	Michigan	43	142,400	1,559,004	677,397	881,607	118,181	1,428	390,147
17	Minnesota	24	56,300	811,269	437,611	373,658	70,556	470	167,323
18	Mississippi	7	.....	1,553,455	876,030	677,425	18,054	1,082	306,270
19	Missouri	42	46,050	753,863	484,935	268,928	33,578	635	156,887
20	New Hampshire	89	224,900	14,721,786	5,304,506	9,417,280	858,253	9,400	3,341,695
21	New Jersey	50	321,983	7,793,714	3,923,511	3,870,203	649,032	7,248	2,416,371
22	New York	339	2,223,622	46,461,914	22,560,855	23,901,059	2,624,573	37,992	13,033,901
23	North Carolina	32	6,200	411,988	227,330	184,658	17,855	508	95,739
24	Ohio	113	192,810	3,550,879	1,609,893	1,940,986	205,041	3,329	915,656
25	Oregon	6	.....	1,350,585	342,820	1,007,765	86,906	402	175,313
26	Pennsylvania	703	6,305,859	61,142,888	28,086,739	33,056,149	3,963,798	55,354	19,764,386
27	Rhode Island	85	2,552,476	26,039,361	11,660,236	14,379,125	1,978,752	19,325	7,049,109
28	Tennessee	49	2,700	1,393,679	672,013	721,666	56,263	998	239,657
29	Texas	4	.....	371,270	256,130	115,140	17,333	359	138,795
30	Utah	14	28,250	612,579	297,045	315,534	29,301	344	121,176
31	Vermont	39	173,500	4,059,264	1,472,666	2,586,598	241,573	2,303	895,284
32	Virginia	37	38,625	941,071	494,087	446,984	69,537	612	166,798
33	West Virginia	32	3,800	343,881	171,970	171,911	15,708	307	67,380
34	Wisconsin	56	164,825	3,711,104	1,332,273	2,378,831	226,851	3,383	810,463
35	All other states (b)	11	11,550	198,879	104,758	94,121	11,266	151	46,098

a Includes piecoworkers and their wages.

ALL CLASSES, BY STATES AND TERRITORIES: 1890.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued. | POWER.

Officers, firm members, and clerks.			Operatives and skilled. (a)				Unskilled.				Steam.			
Males above 16 years.	Females above 15 years.	Wages.	Males above 16 years.	Females above 15 years.	Children.	Wages.	Males above 16 years.	Females above 15 years.	Children.	Wages.	Number of boilers.	Number of engines.	Horse power.	
5,050	223	$5,742,848	89,063	105,338	14,506	$69,050,823	4,333	432	187	$1,867,071	3,077	1,798	152,009	1
6	.....	3,053	29	142	250	64,610	1	.....	.....	300	3	3	115	2
9	.....	2,950	7	12	3	3,281	.....	.....	.....	.....	2	2	35	3
44	.....	44,590	861	418	24	276,411	28	.....	.....	7,823	15	11	1,450	4
227	4	342,728	6,403	5,510	555	4,460,816	277	43	28	137,239	204	100	8,543	5
7	2	12,298	131	110	39	87,625	8	.....	.....	3,472	7	4	230	6
28	.....	17,227	95	292	101	83,654	12	.....	.....	3,472	3	4	59	7
119	4	119,084	678	1,344	70	716,695	34	40	3	23,110	45	33	1,414	8
127	8	117,550	1,053	1,710	172	686,162	38	.....	1	13,675	64	44	2,183	9
38	2	29,670	136	178	15	99,623	15	2	1	6,497	13	8	350	10
89	4	93,228	798	927	178	505,203	30	10	.....	16,624	44	31	2,046	11
7	.....	9,514	20	258	.....	42,643	1	.....	.....	360	2	1	110	12
124	5	138,791	2,962	2,005	150	1,780,960	205	2	.....	71,925	68	18	3,341	13
24	.....	21,350	207	320	133	161,847	5	.....	.....	2,200	10	7	353	14
697	40	1,029,088	20,660	18,725	1,831	14,683,068	1,001	73	11	441,878	615	338	35,687	15
74	3	59,498	391	904	32	323,068	24	.....	.....	7,581	35	26	915	16
34	1	34,381	180	248	1	130,217	6	.....	.....	2,725	14	12	327	17
13	.....	11,280	396	443	224	293,190	6	.....	.....	1,800	10	7	583	18
58	4	31,476	198	304	59	122,513	12	.....	.....	2,898	28	27	748	19
170	7	219,519	3,961	4,688	248	3,007,647	207	107	12	114,529	80	41	2,856	20
124	2	163,553	3,091	3,546	336	2,192,612	149	.....	.....	60,206	112	53	5,342	21
802	26	974,723	13,629	20,772	2,123	11,819,654	598	31	11	239,524	393	248	21,574	22
30	.....	13,561	146	230	84	77,895	18	.....	.....	4,283	13	10	257	23
166	7	153,358	648	2,238	229	747,193	40	1	.....	15,105	86	71	2,291	24
44	.....	32,775	185	134	23	186,983	16	.....	.....	5,555	.....	.....	.....	25
1,340	88	1,384,833	20,693	26,646	5,406	17,923,026	1,038	67	76	456,527	842	498	42,025	26
276	4	366,744	8,672	8,090	1,839	6,521,318	363	44	37	161,047	242	111	14,663	27
69	2	48,629	335	441	120	182,536	24	3	4	8,501	20	15	772	28
17	.....	18,115	113	176	41	115,980	12	.....	.....	4,700	5	4	225	29
20	.....	16,575	145	155	19	103,001	5	.....	.....	1,600	7	5	207	30
57	.....	56,234	1,085	1,039	40	810,438	80	.....	2	28,612	31	18	1,589	31
46	1	23,745	297	224	31	140,059	13	.....	.....	2,994	6	5	247	32
36	1	13,282	136	117	10	53,130	6	.....	1	966	19	17	525	33
120	6	134,150	682	2,396	116	657,422	54	9	.....	18,891	34	21	810	34
8	2	5,305	40	96	4	40,343	1	.....	.....	450	5	5	137	35

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 2; Florida, 1; Idaho, 1; Kansas, 2; Nebraska, 1; South Carolina, 1; South Dakota, 2; Washington, 1.

TABLE 3.—STATISTICS OF WOOL MANUFACTURE, ALL

	STATES AND TERRITORIES.	POWER—continued.						MACHINERY.						
		Water.				Other power.			Combing machines.		Spindles.			Looms.
		Water wheels.		Turbine wheels.				Cards. (Sets.)						
		Number.	Horse power.	Number.	Horse power.	Number of motors.	Horse power.		Foreign.	American.	Woolen.	Worsted	Cotton.	
1	The United States	569	21,678	1,012	63,045	45	672	8,198	674	181	2,329,099	657,324	196,077	69,807
2	Alabama	4	52	2	35			8			160		128	12
3	Arkansas	2	45	1	10			7			735			24
4	California			1	80	1	7	70			18,598			292
5	Connecticut	29	2,228	91	5,685	2	45	646	34		198,326	26,656	5,000	3,640
6	Delaware			4	213			15			7,306			229
7	Georgia	7	135	7	292	1	15	22			4,512			119
8	Illinois			6	285	2	24	71			24,569			323
9	Indiana	9	327	14	364			153		4	48,082		6,000	1,006
10	Iowa	1	12	13	357			36			10,828			158
11	Kentucky	11	112	5	120	2	46	104	3	1	37,971	3,200		1,679
12	Louisiana					1	7	1					1,850	2
13	Maine	44	2,107	68	5,560			387	5		119,418		7,000	2,020
14	Maryland	4	57	6	212			30			8,294		2,856	114
15	Massachusetts	84	4,235	234	21,359			1,837	197	68	541,626	190,814	48,334	16,354
16	Michigan	5	130	13	389			68			17,239			158
17	Minnesota	10	101	5	479			37			7,510			125
18	Mississippi			2	75			31			9,196			376
19	Missouri	7	82	1	10	1	5	52			12,964		20	261
20	New Hampshire	22	1,409	112	6,449	1	5	492	25	4	148,870	21,304	3,000	4,049
21	New Jersey	10	316	20	1,001	2	2	235	26	3	63,065	23,552		1,533
22	New York	94	3,623	151	10,805	8	87	1,403	56	32	289,672	118,704	22,528	5,163
23	North Carolina	14	128	12	282			35			4,682		6,820	169
24	Ohio	15	263	16	289	6	32	112		5	34,699		20	717
25	Oregon			6	487			21			6,052			95
26	Pennsylvania	72	1,745	70	2,007	11	243	1,299	181	10	409,096	126,027	56,913	22,144
27	Rhode Island	22	1,821	63	3,305	6	150	572	146	49	177,072	144,271	34,808	6,607
28	Tennessee	28	300	11	241	1	4	80			19,138		800	925
29	Texas							9			1,900			135
30	Utah			10	270			31			7,960			99
31	Vermont	22	1,474	29	1,375			157			51,423			682
32	Virginia	21	233	16	429			60			14,398			212
33	West Virginia	10	119	3	22			42			7,404			153
34	Wisconsin	22	624	17	547			69	1	5	24,806	2,796		258
35	All other states			3	31			6			1,528			34

CLASSES, BY STATES AND TERRITORIES: 1890—Continued.

Total.	COST OF MATERIALS USED.												
	Foreign wool in condition purchased.	Domestic wool in condition purchased.	Shoddy.	Waste and wool noils.	Camel's hair and noils.	Mohair and noils.	All other animal hair.	Raw cotton.	Yarns not made in mill.				
									Woolen.	Worsted.	Cotton.	Mohair.	
[illegible]	$25,775,078	$72,765,406	$6,929,334	$5,417,429	$1,250,367	$848,533	$1,153,907	$8,568,149	$11,285,379	$23,345,646	$17,985,376	$534,169	1
114,890	.....	3,464	6,000	.....	.....	.....	.....	700	.....	.....	95,742	.....	2
28,050	.....	23,325	.....	2,500	.....	.....	.....	50	.....	.....	1,560	.....	3
823,361	50,750	600,110	8,050	6,000	.....	.....	.....	12,536	7,000	18,291	1,782	1,099	4
12,533,174	1,580,778	4,467,523	563,177	216,645	114,593	88,137	14,225	509,892	227,142	2,317,765	560,154	3,251	5
295,805	6,543	139,658	16,546	40,037	.....	.....	.....	4,063	.....	.....	59,400	.....	6
166,606	10,200	57,574	2,250	397	4,458	.....	.....	13,957	.....	.....	69,419	.....	7
1,770,080	18,340	830,640	23,557	6,000	4,000	.....	.....	37,548	156,655	54,610	459,161	.....	8
2,288,710	229,406	1,454,290	51,305	31,310	5,671	.....	.....	173,278	34,736	11,002	70,395	.....	9
507,478	90	451,223	7,650	.....	.....	.....	.....	.....	1,169	400	3,358	.....	10
1,657,010	17,036	768,244	127,716	5,225	.....	.....	.....	197,764	.....	109,688	227,743	.....	11
58,454	.....	100	.....	.....	.....	.....	.....	30,100	.....	.....	24,000	.....	12
5,709,186	444,313	3,461,423	250,864	62,544	25,938	228,386	90,000	245,329	24,389	33,391	205,923	.....	13
512,170	25,000	298,420	4,000	42,000	.....	.....	.....	1,444	34,130	14,600	38,190	.....	14
44,826,084	7,217,287	18,213,516	2,158,839	829,945	548,240	301,149	154,468	1,174,865	437,762	5,192,064	2,422,344	121,356	15
889,431	81,105	495,614	37,058	23,280	.....	.....	.....	29,497	75,969	16,250	15,324	.....	16
397,040	.....	261,724	500	.....	.....	.....	.....	.....	28,000	34,400	8,562	.....	17
548,039	.....	359,299	7,920	.....	.....	.....	.....	110	.....	.....	91,375	.....	18
342,405	840	259,664	1,256	400	.....	.....	.....	13,471	20,250	.....	15,548	.....	19
8,802,056	1,325,964	4,421,399	508,895	150,557	22,960	34	900	292,931	110,069	339,070	559,298	.....	20
6,633,273	468,281	3,007,835	284,327	236,369	.....	456	45,744	226,766	248,872	461,099	341,066	6,000	21
30,428,307	5,413,769	7,892,296	741,588	1,688,000	227,372	3,546	112,340	2,816,867	999,232	1,661,559	2,240,634	35,500	22
285,283	13,005	122,259	8,000	4,672	.....	.....	3,230	27,009	3,600	.....	67,940	.....	23
2,312,977	142,908	1,114,287	34,768	9,281	680	.....	30	7,268	510,896	153,717	187,654	.....	24
327,502	.....	256,374	700	.....	.....	.....	.....	7,484	.....	.....	11,120	.....	25
33,894,049	5,104,106	11,191,122	1,370,042	1,310,650	246,627	173,672	732,363	2,066,020	7,610,113	8,795,198	8,839,675	323,599	26
21,594,767	3,242,965	9,431,759	393,535	461,667	41,728	53,153	697	429,488	332,419	4,034,951	971,033	43,364	27
760,036	38,218	407,407	33,165	8,272	.....	.....	.....	69,465	.....	.....	166,340	.....	28
188,607	.....	162,600	145	.....	.....	.....	.....	10,220	.....	.....	.....	.....	29
189,339	.....	126,240	.....	64	.....	.....	.....	1,540	20,988	3,287	5,112	.....	30
2,064,167	276,738	948,234	196,458	138,392	1,938	.....	.....	94,869	1,500	12,500	146,056	.....	31
463,040	6,308	305,257	30,479	552	240	.....	.....	60,901	30	.....	9,805	.....	32
210,761	1,389	184,001	1,740	141	.....	.....	.....	1,302	213	.....	4,005	.....	33
2,016,384	59,739	1,007,102	58,804	142,529	5,922	.....	.....	11,415	394,829	81,804	78,760	.....	34
98,240	.....	41,483	.....	.....	.....	.....	.....	.....	5,465	.....	36,898	.....	35

TABLE 3.—STATISTICS OF WOOL MANUFACTURE, ALL

COST OF MATERIALS USED—continued.

	STATES AND TERRITORIES.	Yarns not made in mill—Continued.				Oil.	Fuel.						
		Silk.	Spun silk.	Jute.	Linen.		Soap.	Chemicals and dyestuffs.	Total.	Coal.	Wood.	Rent of power and heat.	All other materials.
1	The United States	$1,395,176	$591,226	$1,709,461	$1,621,293	$1,374,049	$1,319,203	$6,453,665	$3,892,456	$3,666,204	$226,252	$279,730	$8,600,450
2	Alabama					353		675	2,148	2,043	105		5,808
3	Arkansas					165	110	50	200	200		50	20
4	California	1,020	6,750			13,405	19,847	28,881	39,761	25,296	14,465	400	7,679
5	Connecticut	144,200	52,970	46,577	49,805	95,934	87,931	470,674	311,712	282,289	29,423	2,452	598,634
6	Delaware					1,144	5,221	9,671	2,410	2,410			20,512
7	Georgia					893	465	1,994	2,394	1,133	1,261		2,695
8	Illinois	36,385	10,200		8,000	9,461	15,863	37,795	29,808	29,758	50	3,820	28,247
9	Indiana	555				14,112	23,361	113,217	45,122	44,612	510	1,030	29,920
10	Iowa					3,881	6,081	21,212	6,472	3,953	2,519		6,011
11	Kentucky					9,715	3,692	68,401	29,433	28,834	599	300	92,053
12	Louisiana					100		550	2,352	2,352		450	802
13	Maine	225	5,565			49,279	55,393	256,228	150,549	103,571	46,978	4,678	114,769
14	Maryland					2,570	1,462	13,733	9,729	9,639	90		26,892
15	Massachusetts	204,377	100,299	203,047	332,949	303,969	294,850	1,701,278	1,059,019	1,033,365	25,654	59,012	1,795,449
16	Michigan	36,925	1,300			6,381	13,608	16,476	21,886	14,636	7,250	1,890	15,848
17	Minnesota	9,016				4,203	5,998	9,464	8,374	6,477	1,897	2,142	24,657
18	Mississippi					2,263	4,277	13,400	13,455	750	12,705		16,000
19	Missouri					4,060	1,877	8,215	8,882	7,812	1,070	944	6,998
20	New Hampshire	23,079	1,660			62,792	74,734	367,358	231,983	194,634	37,349	17,418	290,955
21	New Jersey	6,371	13,430	37,061	6,437	52,092	55,327	234,853	119,769	119,769		3,685	177,433
22	New York	176,788	61,654	854,745	693,635	180,414	229,362	839,987	507,244	504,880	2,364	37,709	3,014,066
23	North Carolina					1,241	1,400	4,950	2,775	875	1,900	100	5,102
24	Ohio	10,380	4,090	300	820	14,543	23,295	62,616	32,652	31,662	990	2,301	50,491
25	Oregon	57				4,550	6,617	27,591	5,759		5,759	250	7,000
26	Pennsylvania	479,623	236,136	567,731	529,647	368,370	247,496	1,346,081	694,977	693,638	1,339	96,745	1,563,547
27	Rhode Island	252,725	94,921			124,165	94,889	626,354	438,352	419,148	19,204	32,394	494,148
28	Tennessee					4,737	1,272	14,823	14,650	12,523	2,127	270	1,417
29	Texas					738	2,060	7,800	3,128	3,125	3		1,916
30	Utah	250				2,296	2,917	8,692	5,423	5,413	10	450	12,080
31	Vermont	4,600	58			17,228	21,252	65,286	44,430	40,020	4,410	3,141	111,507
32	Virginia					5,240	4,426	14,487	5,488	4,703	785		19,827
33	West Virginia					2,267	2,197	7,973	4,505	4,285	220	300	728
34	Wisconsin	8,600	2,192			11,356	11,343	50,865	35,619	30,868	4,751	7,648	47,856
35	All other states					132	80	2,655	1,996	1,531	465	148	9,383

CLASSES, BY STATES AND TERRITORIES: 1890—Continued.

VALUE OF PRODUCTS.													
Total.	All woolen woven goods.	Union or cotton mixed woven goods.	Goods woven on cotton warps, weft partly or wholly of wool or hair.	Upholstery goods and sundries—woolen.	All worsted woven goods.	Goods woven on cotton warps, weft partly or wholly of worsted.	Upholstery goods and sundries—worsted.	Carpets and rugs.	Felt goods.	Wool hats.	Hosiery and knit goods.	Partly manufactured products for sale.	All other products.	
$237,768,524	$55,892,360	$24,304,966	$39,794,997	$193,863	$26,427,833	$23,592,084	$3,440,270	$46,464,417	$3,120,293	$5,229,176	$63,416,497	$39,433,835	$6,457,933	1
247,875	.....	.....	10,800	.....	.....	.....	.....	.....	.....	.....	190,725	6,350	.....	2
28,360	400	2,110	16,000	.....	.....	.....	.....	.....	.....	.....	.....	19,850	.....	3
1,421,903	716,576	601,032	7,425	.....	.....	.....	.....	.....	.....	.....	38,470	.....	58,400	4
29,843,965	3,861,980	3,695,312	1,548,614	65,000	4,425,471	130,250	305,000	2,184,210	257,442	448,375	3,663,661	58,907	199,743	5
482,022	310,662	162,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,360	.....	6
340,095	.....	3,673	149,372	.....	.....	.....	.....	.....	.....	.....	166,850	20,160	40	7
3,289,541	1,068,636	500	178,550	.....	.....	.....	.....	.....	.....	.....	1,913,526	113,720	14,609	8
3,863,786	1,738,664	142,066	694,100	.....	.....	3,929	.....	.....	.....	.....	670,564	432,623	181,840	9
700,981	569,792	.....	28,378	.....	.....	.....	.....	.....	.....	.....	7,438	94,548	825	10
2,784,768	24,315	.....	2,084,492	.....	.....	293,750	.....	.....	.....	.....	44,000	319,411	18,800	11
152,455	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	139,660	900	11,895	12
8,814,256	4,468,911	1,335,243	2,030,536	.....	1,350	174,322	345,342	.....	107,239	147,748	76,603	126,962	.....	13
760,339	572,156	200	.....	.....	.....	.....	.....	700	.....	.....	180,823	6,460	.....	14
72,681,408	17,568,523	5,811,961	10,695,826	.....	6,704,964	7,532,367	354,286	7,003,956	842,890	1,700,486	4,725,024	9,289,694	451,431	15
1,689,974	630,626	360	9,465	.....	.....	.....	.....	.....	.....	.....	607,551	184,592	257,380	16
723,738	464,550	.....	.....	.....	.....	.....	.....	.....	.....	.....	181,928	75,445	1,815	17
924,185	4,900	450	864,760	.....	.....	.....	.....	.....	.....	.....	.....	54,075	.....	18
629,902	200,960	99,497	50,835	.....	.....	.....	.....	.....	.....	.....	81,628	196,982	.....	19
14,445,172	3,287,023	1,941,582	2,525,856	.....	225,438	2,403,120	3,090	.....	150,010	.....	3,413,618	412,178	83,257	20
9,984,640	2,104,191	2,178,644	1,089,596	.....	332,699	150,000	215,302	579,522	432,285	.....	1,077,452	1,811,584	13,365	21
53,340,151	3,740,046	1,422,239	1,159,550	40,000	1,834,785	1,026,716	215,270	14,280,442	824,712	1,489,132	23,494,469	1,575,896	2,236,894	22
435,821	58,570	330	146,440	.....	.....	.....	.....	.....	.....	.....	126,625	103,606	250	23
3,915,950	895,664	1,754	249,652	.....	.....	360,000	.....	60	367,100	.....	1,614,640	403,220	23,860	24
614,932	123,938	161,040	310,103	.....	.....	.....	.....	.....	.....	.....	15,267	4,584	.....	25
89,337,419	5,294,021	3,733,950	11,498,213	60,263	2,675,958	4,949,164	1,365,656	22,414,127	138,615	1,443,435	15,742,440	17,355,801	2,665,776	26
34,722,493	5,335,846	1,328,383	2,446,404	28,600	10,227,168	6,489,937	636,324	1,200	.....	.....	2,316,970	5,821,967	89,694	27
1,216,419	46,065	6,063	995,467	.....	.....	.....	.....	.....	.....	.....	.....	168,804	.....	28
350,230	.....	181,000	126,000	.....	.....	.....	.....	.....	.....	.....	.....	52,230	.....	29
392,094	197,260	64,569	33,986	.....	.....	.....	.....	.....	.....	.....	47,960	41,184	7,135	30
3,829,641	648,542	1,199,453	764,876	.....	.....	78,529	.....	.....	.....	.....	1,105,958	30,283	2,000	31
788,899	382,294	66,280	69,065	.....	.....	.....	.....	200	.....	.....	179,000	91,970	.....	32
359,132	200,160	28,780	9,796	.....	.....	.....	.....	.....	.....	.....	21,332	89,904	160	33
3,480,005	1,278,267	136,495	.....	.....	.....	.....	.....	.....	.....	.....	1,478,752	447,727	138,764	34
206,063	98,802	.....	840	.....	.....	.....	.....	.....	.....	.....	93,563	12,858	.....	35

TABLE 4.—SUMMARY OF STATISTICS OF WOOL MANUFACTURE,

	CLASSES.	Number of establishments.	CAPITAL. Value of hired property.	Direct investment. Aggregate.	Value of plant. Total.	Land.	Buildings.	Machinery, tools, and implements.	Live assets. Total.	Raw materials.
1	Total	2,489	$17,320,780	$296,494,481	$129,721,571	$14,954,323	$40,144,544	$74,622,704	$166,772,910	$45,330,372
2	Woolen mills	1,311	6,859,174	130,989,940	57,820,243	6,534,819	19,332,575	31,952,849	73,169,697	19,494,122
3	Worsted mills	143	4,109,526	68,085,116	27,890,810	2,842,769	7,962,865	17,085,176	40,194,306	10,844,736
4	Carpet mills (other than rag)	173	1,278,150	38,208,842	17,375,384	2,884,139	5,559,458	8,931,787	20,833,458	6,754,041
5	Felt mills	34	128,400	4,460,621	1,865,984	276,780	714,453	874,751	2,594,637	835,694
6	Wool hat mills	32	226,960	4,142,224	1,194,389	144,350	381,105	668,934	2,947,835	900,459
7	Hosiery and knitting mills	796	4,718,570	50,607,738	23,574,761	2,271,466	6,194,088	15,109,207	27,032,977	6,501,320

	CLASSES	POWER. Steam. Number of boilers	Number of engines.	Horse power.	Water. Water wheels. Number.	Horse power.	Turbine wheels. Number.	Horse power.	Other power. Number of motors.	Horse power.	MACHINERY. Cards. (Sets.)	Combing machines. Foreign.	American.
8	Total	3,077	1,798	152,009	569	21,678	1,012	63,045	45	672	8,198	674	181
9	Woolen mills	1,547	879	67,192	460	15,249	732	39,783	13	276	5,243	39	9
10	Worsted mills	519	274	36,727	26	2,118	84	10,272	9	216	953	544	129
11	Carpet mills (other than rag)	297	130	20,146	6	295	16	2,236	1	7	392	77	41
12	Felt mills	74	51	3,155	9	417	14	1,470	.....	.....	198	.....	.....
13	Wool hat mills	64	34	2,781	5	280	5	234	.....	.....	229	.....	.....
14	Hosiery and knitting mills	576	430	22,008	63	3,319	161	9,041	22	173	1,183	14	2

	CLASSES.	MACHINERY—Continued. Looms, on carpets and rugs—Continued. Moquette power looms.	Velvet power looms.	Wilton power looms.	Rug hand looms.	Rug power looms.	Knitting machines.	MATERIALS USED. Total cost.	Foreign wool in condition purchased. Pounds.	Cost.	Domestic wool in condition purchased Pounds.	Cost.
15	Total	462	58	62	1,832	578	36,462	$203,095,572	114,116,612	$25,775,078	258,680,801	$72,765,406
16	Woolen mills	.....	.....	.....	22	.....	103	82,270,335	16,822,138	$4,110,488	168,485,806	$44,749,323
17	Worsted mills	.....	.....	.....	.....	.....	32	50,706,769	37,869,023	10,591,129	59,832,451	17,689,158
18	Carpet mills (other than rag)	462	58	62	1,810	578	.....	28,644,905	54,742,234	9,422,031	2,139,332	433,756
19	Felt mills	.....	.....	.....	.....	.....	.....	2,809,937	1,689,588	448,350	5,039,495	1,393,032
20	Wool hat mills	.....	.....	.....	.....	.....	.....	2,802,041	259,325	75,615	4,278,628	1,373,184
21	Hosiery and knitting mills	.....	.....	.....	.....	.....	36,327	35,861,585	2,734,304	1,127,465	18,905,089	7,126,953

	CLASSES.	MATERIALS USED—continued. Yarns not made in mill. Woolen yarn. Pounds.	Cost.	Worsted yarn. Pounds.	Cost.	Cotton yarn. Pounds.	Cost.	Mohair yarn. Pounds.	Cost.	Silk yarn. Pounds	Cost.
22	Total	31,385,664	$11,285,379	28,813,717	$23,345,646	83,624,868	$17,985,376	738,777	$534,169	244,306	$1,395,176
23	Woolen mills	4,982,919	3,000,984	2,560,619	2,540,667	23,990,406	5,239,928	324,181	297,995	120,571	632,545
24	Worsted mills	903,174	355,592	11,551,264	11,814,625	9,454,874	2,441,972	232,071	212,364	46,138	344,556
25	Carpet mills (other than rag)	18,763,201	4,112,324	10,555,799	4,711,249	17,920,498	2,712,484	182,400	23,712	.....	.....
26	Felt mills	.....	.....	.....	.....	10,241	2,019	.....	.....	.....	.....
27	Wool hat mills	350,000	24,982	.....	.....	.....	.....	.....	.....	.....	.....
28	Hosiery and knitting mills	6,386,370	3,791,497	4,146,035	4,279,105	32,248,849	7,588,973	125	98	77,597	418,075

a Includes officers, firm members, and clerks. For detailed information see Table 11.

BY CLASSES, FOR THE UNITED STATES: 1890.

CAPITAL—continued.		MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYES AND TOTAL WAGES. (a)		
Direct investment—Continued.											
Live assets—Continued.											
Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	
$64,022,114	$57,420,424	$19,249,508	$1,348,818	$1,174,793	$1,353,049	$3,179,531	$5,841,963	$6,351,354	219,132	$76,660,742	1
29,489,237	24,186,338	8,402,623	541,807	530,236	647,602	1,390,810	2,865,941	2,426,227	79,351	28,478,931	2
15,606,658	13,742,912	4,917,760	296,237	267,713	250,385	808,820	1,595,813	1,698,792	43,593	15,880,183	3
5,705,756	8,373,661	1,819,441	108,997	108,468	125,280	275,555	349,378	791,763	29,121	11,633,116	4
824,370	934,573	232,871	12,648	16,000	29,825	49,696	51,756	72,954	2,206	1,041,296	5
1,029,917	1,017,459	249,568	19,070	13,432	26,703	79,134	75,196	3,592	1,363,944	6	
11,366,176	9,165,481	3,627,245	370,059	178,944	273,254	618,627	899,939	1,286,422	61,209	18,263,272	7

MACHINERY—continued.

Spindles.			Looms on woolen and worsted goods.					Looms on carpets and rugs.							
Woolen.	Worsted.	Cotton.	Broad looms on woolen goods.	Broad looms on worsted goods.	Narrow looms on woolen goods.	Narrow looms on worsted goods.	Hand looms.	Ingrain hand looms.	Ingrain power looms.	Venetian hand looms.	Venetian power looms.	Tapestry brussels power looms.	Body brussels power looms.	Axminster power looms.	
2,329,099	657,324	196,077	20,848	8,482	17,653	11,447	448	638	4,215	158	109	1,498	1,224	95	8
1,742,288	19,750	53,342	19,028	1,037	17,289	1,436	296	7	1						9
297,180	479,675	68,225	1,366	7,445	297	9,936	51								10
53,046	151,132	4,680	194		44		99	631	4,214	157	109	1,498	1,224	95	11
13,829			200		10										12
															13
312,756	6,767	69,830	60		13	75				1					14

MATERIALS USED—continued.

Total foreign and domestic wool in scoured pounds.	Shoddy.		Waste and wool noils.		Camel's hair and noils.		Mohair and noils.		All other animal hair.		Raw cotton.		
	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	
214,945,513	61,561,619	$6,929,334	23,370,056	$5,417,429	7,684,804	$1,250,367	2,136,244	$848,533	16,865,764	$1,153,997	75,428,865	$8,568,149	15
108,226,094	51,862,397	5,398,617	13,608,369	2,353,364	1,781,240	289,970	60,523	15,991	9,619,277	493,492	36,993,712	4,198,527	16
54,240,746	2,608,831	347,006	1,391,444	466,648	4,411,543	672,392	2,038,732	824,869	1,083,690	120,585	3,881,743	438,637	17
25,726,837	598,512	39,295	860,246	146,876	1,001,920	140,175	32,302	5,456	3,645,096	373,822	1,725,761	181,637	18
4,213,230	1,450,384	179,505	1,344,619	262,887	68,250	3,071			2,355,928	48,301	395,032	37,133	19
3,018,114	306,351	85,963	662,092	166,162	11,688	5,610	4,508	2,130	147,600	113,878			20
16,771,492	4,735,144	878,948	5,503,286	2,021,492	410,154	139,149	169	87	14,173	3,918	32,432,617	3,712,215	21

MATERIALS USED—continued.

Yarns not made in mill—Continued.						Oil.		Soap.		Chemicals and dyestuffs.	Total cost.	Fuel.		Rent of power and heat.	All other materials.	
Spun silk yarn.		Jute yarn.		Linen yarn.								Coal.	Wood.			
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Gallons.	Cost.	Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost.	
171,529	$581,226	23,795,444	$1,709,461	10,123,816	$1,621,293	4,243,618	$1,374,049	39,290,827	$1,319,203	$6,453,665	$3,892,456	$3,666,204	$226,252	$279,730	$8,600,450	22
69,358	281,211	125,327	13,181	2,529	895	2,439,573	773,839	18,572,964	614,997	3,213,929	1,711,169	1,528,208	182,961	108,669	2,230,454	23
19,427	127,775			100,350	50,473	664,750	258,476	9,486,021	333,288	1,445,965	1,048,245	1,026,320	21,925	62,427	1,060,567	24
		23,670,117	1,696,280	9,719,242	1,504,590	546,734	184,891	3,118,925	101,499	978,877	446,501	446,251	250	18,055	1,411,394	25
						41,240	14,704	834,295	32,718	122,100	92,551	90,553	1,998	750	172,816	26
						22,817	7,102	631,476	23,857	128,741	84,904	84,904		2,250	707,663	27
42,744	182,240			301,695	65,335	528,504	135,037	6,647,236	212,844	564,053	509,086	489,968	19,118	87,579	3,017,436	28

TABLE 4.—SUMMARY OF STATISTICS OF WOOL MANUFACTURE,

	CLASSES.	PRODUCTS. All wool woven goods. Aggregate value.	Total. Square yards.	Total. Value.	Cloths, doeskins, cassimeres, cheviots, indigo flannels, and broadcloths for men's wear. Square yards.	Cloths, doeskins, cassimeres, cheviots, indigo flannels, and broadcloths for men's wear. Value.	Overcoatings, cloakings, and kerseys for both men's and women's wear. Square yards.	Overcoatings, cloakings, and kerseys for both men's and women's wear. Value.	Carriage cloths of all weights. Square yards.	Carriage cloths of all weights. Value.
1	Total	$337,768,524	101,299,065	$55,892,300	25,637,998	$24,076,808	4,826,767	$5,746,015	1,282,921	$626,791
2	Woolen mills	133,577,977	95,807,636	51,205,385	23,008,903	21,648,649	4,020,612	4,695,723	1,282,921	626,791
3	Worsted mills	79,194,652	4,800,230	4,109,368	2,258,947	2,067,982	806,155	1,050,292	.....	.....
4	Carpet mills (other than rag)	47,770,193	111,862	80,300	.....	.....	.....	.....	.....	.....
5	Felt mills	4,654,768	579,337	497,307	370,148	360,177	.....	.....	.....	.....
6	Wool hat mills	5,329,921	.....	.....	.....	.....	.....	.....	.....	.....
7	Hosiery and knitting mills	67,241,013	.....	.....	.....	.....	.....	.....	.....	.....

	CLASSES.	PRODUCTS—continued. Union or cotton mixed woven goods. Total. Square yards.	Total. Value.	Unions, tweeds, cheviots, cassimeres, or other goods for men's wear. Square yards.	Unions, tweeds, cheviots, cassimeres, or other goods for men's wear. Value.	Overcoatings and cloakings. Square yards.	Overcoatings and cloakings. Value.	Sackings, tricots, and dress goods for women's wear. Square yards.	Sackings, tricots, and dress goods for women's wear. Value.	Flannels and linseys. Square yards.	Flannels and linseys. Value.
8	Total	56,322,882	$24,304,966	21,042,283	$12,720,597	4,379,128	$3,141,111	9,892,377	$2,532,598	11,621,679	$3,314,733
9	Woolen mills	54,385,108	23,009,976	20,023,283	12,103,503	3,528,942	2,497,092	9,892,377	2,532,598	11,621,679	3,314,733
10	Worsted mills	1,937,774	1,294,990	1,019,000	617,094	850,186	644,019	.....	.....	.....	.....
11	Carpet mills (other than rag)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12	Felt mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
13	Wool hat mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
14	Hosiery and knitting mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

	CLASSES.	PRODUCTS—continued. Goods woven on cotton warps, weft partly or wholly of wool or hair—Continued. Wool-filling dress goods and repellents. Square yards.	Wool-filling dress goods and repellents. Value.	Flannels and shirtings. Square yards.	Flannels and shirtings. Value.	Blankets. Square yards.	Blankets. Value.	Jeans, kerseys, and linseys. Square yards.	Jeans, kerseys, and linseys. Value.	Upholstery goods and sundries—wool. Total value.	Tapestry, terry, rep, and damask. Square yards.	Tapestry, terry, rep, and damask. Value.
15	Total	17,655,803	$4,274,012	16,778,222	$4,795,797	10,929,529	$3,068,666	17,126,217	$4,738,034	$193,863	136,882	$100,263
16	Woolen mills	17,150,803	4,184,262	16,729,685	4,782,829	8,703,822	2,546,338	17,126,217	4,738,034	133,600	35,000	40,000
17	Worsted mills	505,000	89,750	33,390	6,104	2,225,707	522,328	.....	.....	.....	.....	.....
18	Carpet mills (other than rag)	.....	.....	.....	.....	.....	.....	.....	.....	60,263	101,882	60,263
19	Felt mills	.....	.....	15,147	6,864	.....	.....	.....	.....	.....	.....	.....
20	Wool hat mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21	Hosiery and knitting mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

	CLASSES.	PRODUCTS—continued. Goods woven on cotton warps, weft partly or wholly of worsted. Total. Square yards.	Total. Value.	Cassimeres, doeskins, coatings, suitings, and other goods for men's wear. Square yards.	Cassimeres, doeskins, coatings, suitings, and other goods for men's wear. Value.	Worsted-filling dress goods, delaines, cashmeres, serges, and other stuffs for women's wear. Square yards.	Worsted-filling dress goods, delaines, cashmeres, serges, and other stuffs for women's wear. Value.	Linings, Italian cloths, and lastings. Square yards.	Linings, Italian cloths, and lastings. Value.
22	Total	78,021,820	$23,592,084	10,878,800	$9,913,126	62,557,940	$12,423,438	4,585,080	$1,255,520
23	Woolen mills	5,268,142	2,000,031	568,597	563,225	3,531,356	990,904	1,168,189	445,902
24	Worsted mills	72,753,678	21,592,053	10,310,203	9,349,901	59,026,584	11,432,534	3,416,891	809,618
25	Carpet mills (other than rag)	.....	.....	.....	.....	.....	.....	.....	.....
26	Felt mills	.....	.....	.....	.....	.....	.....	.....	.....
27	Wool hat mills	.....	.....	.....	.....	.....	.....	.....	.....
28	Hosiery and knitting mills	.....	.....	.....	.....	.....	.....	.....	.....

BY CLASSES, FOR THE UNITED STATES: 1890—Continued.

PRODUCTS—continued.

All wool woven goods—Continued.

Dress goods, sackings, tricots, ladies' cloth, broadcloth, and other goods for women's wear.		Flannels.		Blankets.		Horse blankets.		Carriage robes.		Woven shawls, wool or worsted.		
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
25. 237. 390	$9, 014, 477	32, 795, 600	$10, 472, 019	5, 059, 725	$2, 694, 574	924, 049	$516, 249	775, 963	$646, 904	4, 758, 652	$2, 098, 523	1
24. 608. 977	8, 769, 257	32, 762, 273	10, 458, 557	4. 666, 057	2, 532, 324	666, 625	357, 411	257, 298	145, 019	4, 533, 970	1, 971, 654	2
628. 413	345. 220	17, 182	2. 662	356, 000	141, 250	97, 548	52. 258	411, 303	422. 835	224. 682	126, 869	3
						4, 500	1, 250	107, 362	79. 050			4
		16. 145	10, 800	37, 668	21, 000	155, 376	105, 330					5
												6
												7

PRODUCTS—continued.

Union or cotton mixed woven goods—Continued.				Goods woven on cotton warps, weft partly or wholly of wool or hair.								
Blankets.		Horse blankets.		Total.		Cassimeres, doeskins, coatings, suitings, and other goods for men's wear.		Overcoatings and cloakings.		Satinets.		
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
4 ·94. 390	$1. 390. 660	4, 583, 025	$1, 205, 267	116, 586, 568	$39, 794, 997	29, 788, 143	$14, 426, 731	5. 677, 998	$4, 195, 675	18, 630. 656	$4. 296, 082	8
4 ·94. 390	1. 390, 660	4, 514, 437	1, 171, 390	111, 027, 431	37, 199, 986	27. 882, 734	13, 273, 684	4, 814, 989	3, 387, 061	18, 619. 181	4, 287, 778	9
		68, 588	33, 877	5, 517, 176	2, 569, 617	1, 890, 070	1. 142, 821	863, 009	808. 614			10
												11
				41. 961	25, 394	15. 339	10. 226			11. 475	8, 304	12
												13
												14

PRODUCTS—continued.

Upholstery goods and sundries—wool—Continued.					All worsted woven goods.							
Braids and braiding.		Picture cord.		Total braids and braiding and picture cord.	Total.		Coatings: serges and suitings for men's wear.		Dress goods, cashmeres, serges, and other goods for women's wear.		Buntings.	
Running yards.	Value.	Running yards.	Value.	Running yards.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
60. 000	$28. 600	50, 000, 000	$65, 000	50. 060, 000	29, 507, 286	$26, 427, 833	17, 591, 087	$22, 386, 452	11, 349. 319	$3. 905. 398	566. 880	$135. 983
60 000	28. 600	50. 000, 000	65. 000	50, 060, 000	3. 048, 248	2, 626, 174	2, 030. 928	2. 245, 287	1, 017. 320	380. 887		
					26. 459, 038	23, 801, 659	15, 560, 159	20, 141, 165	10, 331. 999	3. 524, 511	566, 880	135, 983

PRODUCTS—continued.

Upholstery goods and sundries—worsted.							Carpets.						
Total value.	Worsted or mohair goods, tapestry, plush, terry, and rep.		Braids and braiding.		Webbings, gorings, elastic fabrics, bindings, fringes, and other sundries.		Total carpets and rugs.	Ingrain, 2-ply.		Ingrain, 3-ply.		Ingrain, art.	
	Square yards.	Value.	Running yards.	Value.	Running yards.	Value.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
82. 468. 270	3, 994. 406	$2, 265, 618	82. 545, 251	$993, 022	1, 254, 500	$181, 630	$46, 464. 417	32, 921, 489	$13, 781, 984	3, 251, 368	$1, 816, 484	553, 513	$325, 984
1. 330. 232	2. 810. 158	1. 066, 972	115, 000	106, 000	1, 092, 700	157, 360	7, 334	2, 830	1, 290				
2 919. 636	1. 096, 293	1, 108, 344	82. 430, 251	887, 022	161, 800	24, 270							
99. 382	87, 955	90, 302					46, 457, 083	32, 918, 659	13, 780. 694	3, 251. 368	1. 816. 484	553, 513	325, 984

TABLE 4.—SUMMARY OF STATISTICS OF WOOL MANUFACTURE.

	CLASSES.	PRODUCTS—continued. Carpets—Continued. Tapestry brussels. Running yards.	Tapestry brussels. Value.	Body brussels. Running yards.	Body brussels. Value.	Tapestry velvet. Running yards.	Tapestry velvet. Value.	Wilton or wilton velvet. Running yards.	Wilton or wilton velvet. Value.	Axminster. Running yards.	Axminster. Value.
1	Total	20,008,961	$11,475,846	9,442,348	$8,107,549	2,482,128	$2,239,166	1,030,101	$1,582,409	379,841	$473,165
2	Woolen mills									500	250
3	Worsted mills										
4	Carpet mills (other than rag)	20,008,961	11,475,846	9,442,348	8,107,549	2,482,128	2,239,166	1,030,101	1,582,409	379,341	472,915
5	Felt mills										
6	Wool hat mills										
7	Hosiery and knitting mills										

	CLASSES.	PRODUCTS—continued. Rugs—Continued. Smyrna. Number.	Smyrna. Value.	Other woolen. Number.	Other woolen. Value.	Felt goods. Total. Square yards.	Total. Value.	Cloths. Square yards.	Cloths. Value.	Trimmings and linings. Square yards.	Trimmings and linings. Value.	Skirts and skirting. Square yards.	Skirts and skirting. Value.
8	Total	1,430,036	$2,368,000	26,845	$73,817	6,950,001	$3,120,293	2,628,546	$986,888	1,176,114	$90,738	1,800	$1,200
9	Woolen mills	500	1,000			37,619	22,815	20,000	6,000			1,800	1,200
10	Worsted mills					1,009	1,524	1,009	1,524				
11	Carpet mills (other than rag)	1,429,536	2,367,000	26,845	73,817	103,258	67,118						
12	Felt mills					6,808,115	3,028,836	2,607,537	979,364	1,176,114	90,738		
13	Wool hat mills												
14	Hosiery and knitting mills												

	CLASSES.	PRODUCTS—continued. Wool hats. Total. Dozens.	Total. Value.	Wool hats. Dozens.	Wool hats. Value.	All other hats. Dozens.	All other hats. Value.	Hosiery and knit goods. Total value.	Woolen half hose. Dozens.	Woolen half hose. Value.
15	Total	1,046,481	$5,229,176	972,475	$4,612,151	74,006	$617,025	$63,416,497	1,363,062	$2,900,143
16	Woolen mills	100	300	100	300			97,770	2,238	7,321
17	Worsted mills									
18	Carpet mills (other than rag)									
19	Felt mills									
20	Wool hat mills	1,046,381	5,228,876	972,375	4,611,851	74,006	617,025			
21	Hosiery and knitting mills							63,318,727	1,360,824	2,892,822

	CLASSES.	PRODUCTS—continued. Hosiery and knit goods—Continued. All cotton shirts and drawers. Dozens.	All cotton shirts and drawers. Value.	Leggings and gaiters. Dozens.	Leggings and gaiters. Value.	Gloves and mittens. Dozens.	Gloves and mittens. Value.	Hoods, scarfs, nubias, etc. Dozens.	Hoods, scarfs, nubias, etc. Value.
22	Total	3,247,090	$9,032,221	25,072	$85,401	898,081	$1,942,030	342,497	$1,476,430
23	Woolen mills	500	8,000			1,931	6,950		
24	Worsted mills								
25	Carpet mills (other than rag)								
26	Felt mills								
27	Wool hat mills								
28	Hosiery and knitting mills	3,246,590	9,024,221	25,072	85,401	896,150	1,935,080	342,497	1,476,430

BY CLASSES, FOR THE UNITED STATES: 1890—Continued.

PRODUCTS—continued.

Carpets—Continued.								Rugs.						
Moquette.		Smyrna.		Rag.		All other.		Wilton.		Moquette.		Ingrain.		
Running yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	
1,193,186	$3,247,845	127,177	$332,718	77,410	$25,629	1,316,743	$425,857	40,644	$87,702	60,000	$66,000	6,278	$34,262	1
				6,100	2,490	3,925	2,304							2
1,193,186	3,247,845	127,177	332,718	71,310	23,139	1,312,818	423,553	40,644	87,702	60,000	66,000	6,278	34,262	3
														4
														5
														6
														7

PRODUCTS—continued.

Felt goods—Continued.														
Table and piano covers.		For ladies' hats.		Saddle felts.		Rubber shoe linings.		Endless belts.		Druggets.		Hair felting.		
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
39,000	$57,400	36,000	$18,000	45,904	$22,952	2,087,557	$576,946	216,982	$1,086,086	185,338	$91,742	551,760	$188,341	8
								15,819	15,615					9
														10
										103,258	67,118			11
39,000	57,400	36,000	18,000	45,904	22,952	2,087,557	576,946	201,163	1,070,471	82,080	24,624	551,760	188,341	12
														13
														14

PRODUCTS—continued.

Hosiery and knit goods—Continued.														
Woolen hose.		Merino or mixed half hose.		Merino or mixed hose.		Cotton half hose.		Cotton hose.		Merino or mixed shirts and drawers.		All woolen shirts and drawers.		
Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	
2,251,541	$4,744,009	376,253	$605,173	433,083	$791,227	5,341,628	$3,936,536	7,387,409	$6,214,202	2,526,226	$15,055,999	1,092,841	$8,921,777	15
997	21,213	200	400					150	150			4,000	40,000	16
														17
														18
														19
														20
2,252,544	4,722,796	376,053	604,773	433,083	791,227	5,341,628	3,936,536	7,387,259	6,214,052	2,526,226	15,055,999	1,068,841	8,881,777	21

PRODUCTS—continued.

Hosiery and knit goods—Continued.												
Cardigan jackets, fancy jackets, etc.		Shawls.		Fancy knit goods, wristers, etc.		Boot and shoe linings.		Jersey cloth.				
Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Yards.	Value.	Yards.	Value.			
361,478	$3,576,248	22,990	$115,467	270,633	$759,748	7,596,711	$1,088,558	3,072,533	$2,171,328	22		
				100	100			7,476	13,636	23		
										24		
										25		
										26		
										27		
361,478	3,576,248	22,990	115,467	270,533	759,648	7,596,711	1,088,558	3,065,057	2,157,692	28		

TABLE 4.—SUMMARY OF STATISTICS OF WOOL MANUFACTURE,

	CLASSES.	PRODUCTS—continued.									
		Partly manufactured products for sale.									
		Total.		Woolen yarn, all wool.		Woolen yarn, union or merino.		Worsted yarn.		Cotton yarn.	
		Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1	Total	88,134,330	$39,433,835	35,415,360	$10,742,882	6,799,813	$2,320,088	29,376,182	$22,411,263	3,692,936	$782,849
2	Woolen mills	48,077,114	14,304,804	30,768,571	8,990,106	6,670,757	2,253,792	2,673,546	1,306,927	3,159,047	626,072
3	Worsted mills	36,052,126	23,529,514	3,341,036	1,166,737	71,419	54,271	24,763,501	20,291,046	33,889	6,777
4	Carpet mills (other than rag)	2,616,410	953,127	443,573	104,336	57,637	12,025	1,922,135	799,748	.....	.....
5	Felt mills	10,000	9,000	10,000	9,000	.....	.....	.....	.....	.....	.....
6	Wool hat mills	9,500	1,045	.....	.....	.....	.....	.....	.....	.....	.....
7	Hosiery and knitting mills	1,369,180	636,345	852,180	472,703	.....	.....	17,000	13,642	500,000	150,000

TABLE 5.—WOOLEN MILLS, BY

	STATES AND TERRITORIES.	CAPITAL.								
		Number of establishments.	Value of hired property.	Direct investment.					Live assets.	
				Aggregate.	Value of plant.					
					Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.
1	The United States	1,311	$6,859,174	$130,989,940	$57,820,243	$6,534,819	$19,332,575	$31,952,849	$73,169,697	$19,494,122
2	Alabama	6	400	18,325	15,250	3,800	1,750	9,700	3,075	1,525
3	Arkansas	6	.....	27,435	21,800	1,750	6,050	14,000	5,635	1,235
4	California	8	81,870	2,618,480	1,540,103	170,300	432,705	937,098	1,078,377	183,310
5	Connecticut	55	252,166	10,188,042	4,614,627	462,050	1,862,474	2,290,103	5,573,415	1,544,877
6	Delaware	3	.....	450,974	257,000	33,500	80,000	143,500	193,974	72,170
7	Georgia	14	.....	298,539	208,440	19,222	94,525	94,693	90,099	20,317
8	Illinois	23	3,000	1,649,918	600,939	68,775	193,864	338,300	1,048,979	261,275
9	Indiana	45	42,725	2,880,114	1,365,795	83,437	336,859	915,499	1,514,319	358,302
10	Iowa	14	13,700	694,600	293,800	31,450	83,350	179,000	400,800	72,900
11	Kentucky	40	87,700	2,560,737	1,211,056	69,935	309,960	831,161	1,349,681	374,747
12	Maine	75	76,400	8,338,864	3,503,276	327,725	1,377,050	1,798,501	4,835,588	1,437,520
13	Maryland	9	.....	372,875	228,600	32,200	75,800	120,600	144,275	46,300
14	Massachusetts	165	2,289,401	34,911,187	13,653,662	1,671,678	5,217,380	6,764,604	21,257,525	5,535,310
15	Michigan	32	85,250	943,598	383,464	23,900	119,531	240,033	560,134	115,327
16	Minnesota	21	6,300	563,771	374,861	143,350	114,175	117,336	188,910	50,657
17	Mississippi	7	.....	1,553,455	876,030	64,650	201,950	609,430	677,425	156,791
18	Missouri	35	11,950	720,616	475,428	68,759	143,808	262,861	245,188	59,893
19	New Hampshire	46	42,500	7,540,233	2,882,643	330,825	938,618	1,613,200	4,657,590	1,658,994
20	New Jersey	21	228,583	3,810,832	1,987,064	355,275	662,625	969,164	1,823,768	632,288
21	New York	91	89,665	7,243,380	4,295,243	443,070	1,400,417	2,451,756	2,948,137	597,797
22	North Carolina	27	.....	339,088	184,530	30,980	44,800	108,750	154,558	36,911
23	Ohio	64	14,650	1,609,574	782,951	78,715	242,589	461,647	826,623	223,051
24	Oregon	6	.....	1,350,585	342,820	54,600	96,306	191,914	1,007,765	185,706
25	Pennsylvania	264	2,164,439	21,671,137	10,266,284	1,123,223	3,020,191	6,122,870	11,404,853	3,191,644
26	Rhode Island	40	1,253,000	9,360,927	3,476,501	288,396	944,200	2,243,905	5,884,426	1,513,534
27	Tennessee	49	2,700	1,393,679	672,013	70,545	180,210	421,258	721,666	191,065
28	Texas	4	.....	371,270	256,130	62,005	44,050	150,075	115,140	28,740
29	Utah	9	22,250	579,209	282,125	31,625	83,500	167,000	297,084	60,784
30	Vermont	29	16,500	3,304,382	1,268,110	158,285	505,625	604,200	2,036,272	474,356
31	Virginia	35	38,000	845,221	421,737	65,319	127,475	228,943	423,484	97,132
32	West Virginia	30	2,800	336,281	167,270	15,295	54,400	97,575	169,011	48,708
33	Wisconsin	32	29,725	2,333,700	850,491	137,080	291,838	421,573	1,483,209	249,496
34	All other states (b)	6	3,500	108,912	60,200	13,100	14,500	32,600	48,712	11,460

a Includes officers, firm members, and clerks. For detailed information see Table 12.

BY CLASSES, FOR THE UNITED STATES: 1890—Continued.

PRODUCTS—continued.												
Partly manufactured products for sale—Continued.												
Woolen card rolls.		Worsted slubbing and tops.		Worsted noils.		Waste.		Shoddy and mungo.		Wool extract.		All other products.
Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.
1. 435, 215	$704, 581	391, 501	$106, 516	4, 466, 621	$1, 462, 050	4. 334, 436	$691, 402	1, 586, 300	$179, 851	635, 966	$32, 253	$6. 457. 933
1. 435, 215	704, 581	31, 400	18. 840	45, 000	13, 000	1, 085, 178	180, 425	1, 583, 300	179, 351	625, 100	31, 710	1, 639, 470
.....	.....	360, 101	87, 676	4, 337, 621	1, 433, 050	3, 130, 693	488, 914	3, 000	500	10, 866	543	276, 291
.....	.....	.....	.....	84, 000	16, 000	109, 065	21, 018	.....	.....	.....	.....	62, 000
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1, 094, 231
.....	.....	.....	.....	.....	.....	9, 500	1, 045	.....	.....	.....	.....	100, 000
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3, 285, 941

STATES AND TERRITORIES: 1890.

CAPITAL—continued.		MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		
Direct investment—Continued.											
Live assets—Continued.											
Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	
$29. 489. 237	$24. 186, 338	$8, 402, 623	$541, 807	$530, 236	$647, 602	$1, 390, 810	$2, 865, 941	$2, 426, 227	79, 351	$28, 478, 931	1
600	950	419	24	195	120	80	.....	.....	16	3, 125	2
2. 000	2, 400	752	.....	112	25	225	90	300	31	6, 231	3
545. 234	349, 133	168, 324	5, 696	8, 086	19, 657	11, 617	102, 249	21. 019	1. 264	287. 658	4
2. 497. 033	1, 621, 505	614, 561	14, 059	37, 071	45, 520	90, 140	244. 442	183, 329	5, 173	2. 035, 462	5
86. 156	35, 648	27. 404	.....	887	2, 142	8, 251	1, 705	14. 419	297	103, 395	6
47. 671	22, 111	10, 887	.....	1, 627	16	3, 309	5, 132	803	179	32, 401	7
379. 572	408, 132	110. 159	240	6, 943	10, 134	19, 312	31, 360	42, 170	914	313. 780	8
643. 614	512, 403	232. 105	2, 323	13, 940	25, 201	50, 774	76, 135	63. 732	2, 103	600. 062	9
220. 850	107, 050	40. 050	1, 100	4, 761	3, 346	8, 398	12, 021	10, 424	378	138, 240	10
400. 397	574. 537	176, 756	8, 300	9, 979	17, 353	31, 667	46, 472	62, 984	1. 803	554, 544	11
2. 474. 190	923, 678	472, 848	5, 968	31, 675	44, 397	83, 585	221, 907	85, 316	4, 323	1, 629, 888	12
81. 825	16, 150	14. 442	.....	2, 542	1, 392	3, 434	3, 945	3, 129	383	123, 931	13
8. 421. 466	7, 300, 749	2, 618, 078	176, 810	202. 245	161, 666	397. 922	1, 006, 378	673, 062	19, 813	7, 586, 575	14
155. 603	289, 204	42, 713	4, 414	3, 527	4, 148	6, 494	17, 506	6, 630	518	156, 128	15
115 900	22. 353	46, 211	355	3, 404	4, 721	8. 905	13. 281	15. 545	341	120. 967	16
237. 667	182, 967	18. 054	.....	7. 978	5, 111	635	2. 160	2, 170	1, 082	306. 270	17
114. 865	70. 430	29, 775	666	2. 553	4, 638	8, 118	11. 523	2. 277	510	122. 410	18
1. 979. 232	1, 019, 364	483, 598	3, 235	38. 803	32. 410	92, 725	147, 803	168. 622	4. 189	1. 643, 168	19
6 6. 121	585, 359	405, 715	14, 974	16, 711	19, 438	66, 629	99, 349	188, 614	4. 228	1. 481, 315	20
1. 925. 056	1, 325. 282	353, 245	7, 871	15. 555	27, 514	65. 665	60. 890	175, 750	2. 969	1, 046, 778	21
62. 127	55, 520	14, 758	.....	1, 294	976	1, 220	915	10, 253	324	65. 329	22
306. 779	295, 793	100, 326	1, 165	8, 987	11. 824	20, 739	31, 984	25. 627	1. 032	294, 365	23
383. 629	438, 430	86, 906	.....	2, 795	13, 877	7, 804	33, 984	28. 446	402	175. 313	24
4. 229. 617	3, 983. 592	1, 356. 208	182. 228	49. 593	108, 810	241. 588	336. 640	437. 349	16. 061	5. 729. 982	25
2. 554. 613	1, 816. 279	530, 535	102, 374	20, 914	37, 498	87, 419	190, 609	91. 721	6. 028	2, 297. 416	26
221. 909	308. 692	56, 263	165	6, 953	7, 124	12, 499	18. 719	10. 803	998	239. 657	27
58. 409	28, 000	17. 333	.....	929	2, 104	2. 100	4, 150	8, 050	359	138, 795	28
146. 438	89. 862	27. 155	2, 550	3, 965	4, 180	8, 275	8, 100	85	274	104, 156	29
690, 274	871. 642	178, 385	1, 040	9, 510	11, 551	29, 045	69. 968	57. 271	1, 585	625. 440	30
121. 675	195. 277	43, 972	2, 170	2, 485	5, 513	4, 601	18, 443	9, 760	444	117, 023	31
83. 285	37, 018	15, 418	300	1, 573	1, 529	4, 899	5, 703	1, 414	287	61. 919	32
543. 485	690, 228	104, 226	2, 440	11, 898	13, 259	12. 116	40. 372	24. 153	982	324. 772	33
39. 852	6, 400	5, 043	340	658	408	620	2. 017	1, 000	61	17, 436	34

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Idaho, 1; Kansas, 1; Louisiana, 1; South Carolina, 1; South Dakota, 2.

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES.	MACHINERY.								
		Cards. (Sets.)	Combing machines.		Spindles.			Looms on woolen and worsted goods.		
			Foreign.	American.	Woolen.	Worsted.	Cotton.	Broad looms on woolen goods.	Broad looms on worsted goods.	Narrow looms on woolen goods.
1	The United States	5,243	39	9	1,742,288	19,750	53,342	19,028	1,037	17,289
2	Alabama	6			160		128			12
3	Arkansas	7			735			3		21
4	California	70			18,598			285		7
5	Connecticut	351			124,478			1,546	120	586
6	Delaware	15			7,306			40		189
7	Georgia	20			3,552					119
8	Illinois	57			18,745			185		158
9	Indiana	127		4	40,690		6,000	218	1	786
10	Iowa	36			10,828			103		55
11	Kentucky	97			36,346			15	1	1,606
12	Maine	361			118,138		7,000	1,736	35	40
13	Maryland	30			8,294		2,856	49		61
14	Massachusetts	1,405			484,228		2,008	6,256	54	2,395
15	Michigan	51			13,559			77		80
16	Minnesota	37			7,510			99		26
17	Mississippi	31			9,196			338		38
18	Missouri	52			12,964		20	74		187
19	New Hampshire	343			111,728	120		1,623	80	251
20	New Jersey	144	5		51,697	4,880		714	241	177
21	New York	271			73,019		3,740	762	37	466
22	North Carolina	35			4,682		6,308	12		139
23	Ohio	96		1	26,417		20	187		269
24	Oregon	21			6,052			84		10
25	Pennsylvania	865	18		325,327	1,730	21,524	2,545	397	7,599
26	Rhode Island	311	16	1	114,782	11,232	2,888	1,120	58	626
27	Tennessee	80			19,138		800	14		792
28	Texas	9			1,900			28		107
29	Utah	31			7,960			56		43
30	Vermont	120			41,839			495		187
31	Virginia	54			12,382			125		85
32	West Virginia	41			7,164			42		111
33	Wisconsin	62		3	21,346	1,788		183	13	62
34	All other states	7			1,528		50	14		19

AND TERRITORIES: 1890—Continued.

MACHINERY—continued.							MATERIALS USED.					
Looms on woolen and worsted goods—Continued.		Looms on carpets and rugs.			Total number of power looms.	Knitting machines.	Total cost.	Foreign wool in condition purchased.		Domestic wool in condition purchased.		
Narrow looms on worsted goods.	Hand looms.	Ingrain hand looms.	Ingrain power looms.	Rug hand looms.				Pounds.	Cost.	Pounds.	Cost.	
1,436	298	7	1	22	38,791	103	$82,270,335	16,822,138	$4,110,488	168,485,806	$44,749,323	1
					12		10,997			10,569	3,464	2
					24		28,030			67,500	23,325	3
					292		788,916	145,000	50,750	3,554,471	600,110	4
42					2,294	10	5,753,096	656,752	218,727	12,379,858	3,273,214	5
					229		296,605	35,369	6,543	495,829	139,658	6
					119		95,999	32,000	10,200	176,992	57,574	7
					323	2	789,310	59,000	18,340	2,507,621	636,665	8
	1				1,005	1	1,850,809	476,633	98,498	5,687,051	1,344,171	9
					158	5	505,503	300	90	1,880,232	451,223	10
	1	2			1,622		1,365,246	57,037	17,036	2,407,292	643,110	11
	1				1,811		4,960,119	1,231,813	369,411	11,530,733	3,320,263	12
	3	1			110		424,855	100,000	25,000	786,200	298,420	13
6					8,711	16	21,815,199	2,105,248	745,930	46,825,715	12,971,031	14
1					158	8	529,515	88,665	22,757	1,622,034	432,226	15
					125		309,378			1,358,290	261,724	16
					376		508,039			1,565,524	359,239	17
					261		311,881	4,000	840	1,048,229	259,664	18
					1,954		4,834,446	526,759	120,548	12,561,277	3,190,903	19
8					1,140		3,281,979	158,639	32,337	7,966,247	1,976,024	20
15	19				1,280		2,930,932	1,288,483	377,302	4,453,263	1,516,792	21
18					169		198,358	50,760	13,005	398,500	122,259	22
	11				456	35	962,270	174,764	36,408	2,365,536	769,675	23
		1			94	6	327,502			1,366,148	256,374	24
207	144	3	1	22	11,449	9	19,198,990	6,446,668	1,022,445	24,438,385	5,865,342	25
434					2,238	9	6,042,754	1,522,915	591,229	11,509,947	3,364,913	26
5	114				811		760,036	187,625	38,218	1,280,861	407,407	27
					135		188,607			572,400	162,600	28
					99		163,864			800,500	126,240	29
					682		1,435,163	1,279,250	233,038	2,660,820	692,225	30
	2				210		375,175	25,367	6,308	950,378	304,507	31
					153		202,801	5,001	1,389	595,822	177,701	32
					258		978,479	164,090	54,136	2,461,482	699,697	33
	2				33	2	46,483			219,700	41,583	34

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES.	MATERIALS USED—continued.						
		Total foreign and domestic wool in scoured pounds.	Shoddy.		Waste and wool noils.		Camel's hair and noils.	
			Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
1	The United States	100,226,094	51,862,397	$5,398,617	13,608,369	$2,353,364	1,781,240	$289,970
2	Alabama	10,569	20,000	6,000				
3	Arkansas	64,500			5,000	2,500		
4	California	1,588,993	53,111	8,050	30,000	6,000		
5	Connecticut	6,341,262	5,211,440	521,756	431,457	112,120	67,568	15,552
6	Delaware	265,599	95,890	16,546	557,398	40,037		
7	Georgia	147,646	10,000	2,250	2,474	397	19,867	4,458
8	Illinois	1,321,559	67,253	17,577				
9	Indiana	3,478,264	144,303	21,729	48,600	8,040	600	282
10	Iowa	960,916	46,000	7,650				
11	Kentucky	1,542,884	707,940	110,016	21,054	2,105		
12	Maine	6,784,485	1,498,807	247,233	196,486	62,544	35,178	12,618
13	Maryland	372,900	40,000	4,000	150,000	42,000		
14	Massachusetts	25,493,874	20,272,168	1,934,590	4,799,883	664,839	375,868	88,610
15	Michigan	897,016	269,148	31,383	9,300	2,304		
16	Minnesota	781,552	4,000	500				
17	Mississippi	810,562	36,000	7,920				
18	Missouri	644,238	7,000	1,256	4,000	400		
19	New Hampshire	6,693,439	3,174,370	263,333	538,851	107,735	105,000	18,600
20	New Jersey	4,466,131	2,778,040	270,902	731,704	130,653		
21	New York	3,520,270	1,197,099	151,513	216,177	56,669	9,409	3,934
22	North Carolina	371,952	40,000	8,000	45,738	4,672		
23	Ohio	1,848,702	199,680	33,768	38,312	7,281	3,600	680
24	Oregon	673,594	5,000	700				
25	Pennsylvania	17,814,990	12,125,904	1,135,070	5,086,287	875,886	1,109,454	131,704
26	Rhode Island	7,043,711	1,803,842	318,389	340,946	133,995	38,284	7,930
27	Tennessee	1,135,578	197,690	33,165	49,100	8,272		
28	Texas	332,160	1,000	145				
29	Utah	365,500			800	64		
30	Vermont	1,766,642	1,562,221	192,936	50,000	12,000	8,650	1,938
31	Virginia	650,745	88,585	16,229	5,547	402	1,500	240
32	West Virginia	438,250	9,632	1,740	832	141		
33	Wisconsin	1,477,461	196,274	34,271	248,443	72,308	6,262	3,424
34	All other states	111,150						

AND TERRITORIES: 1890—Continued.

MATERIALS USED—continued.

Mohair and noils.		All other animal hair.		Raw cotton.		Yarns not made in mill.						
						Woolen.		Worsted.		Cotton.		
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	
60,533	$15,991	9,619,277	$493,492	36,993,712	$4,198,527	4,962,919	$3,000,984	2,560,619	$2,540,667	23,990,406	$5,239,928	1
				7,500	700							2
				500	50					5,050	1,560	3
				104,782	12,536			161	291	2,536	782	4
198	50	40,803	2,448	1,454,296	218,232	3,880	2,946	293,230	318,917	1,514,150	282,585	5
				62,500	4,063					252,000	50,400	6
				20,815	1,957					67,000	12,150	7
				178,343	23,498			300	270	140,836	19,960	8
				1,845,162	166,162	6,000	3,000	9,000	7,875	116,212	26,228	9
								500	400	10,610	2,758	10
				1,689,664	187,039					1,066,336	215,263	11
640	386			1,756,360	245,329	6,500	3,895	17,766	22,508	552,966	144,557	12
				12,000	1,444					20,050	6,015	13
28,000	4,200	397,678	22,033	5,370,244	686,522	117,564	101,874	775,770	798,912	3,990,832	897,984	14
								30	25	2,440	524	15
												16
				1,000	110					415,000	91,375	17
				128,407	13,471					26,988	6,048	18
56	34	30,000	900	1,626,007	192,721	136,879	39,018	66,381	78,330	1,133,300	243,904	19
				1,341,000	146,814	1,000	400	105,000	150,160	958,600	216,119	20
1,146	355	805,700	38,512	1,281,637	154,564	60,000	48,500	7,967	8,828	1,041,035	197,998	21
		40,374	3,230	258,500	27,009	6,000	3,600			24,300	5,740	22
				71,650	7,268	5,100	2,547	300	210	125,502	25,924	23
				61,536	7,484					45,010	11,120	24
5,956	1,169	8,304,722	426,369	17,256,155	1,801,784	4,459,896	2,652,674	1,012,249	856,708	10,096,883	2,177,771	25
24,537	9,797			1,151,121	153,806	180,000	142,500	261,965	284,733	1,184,149	315,847	26
				693,019	69,465					769,948	166,340	27
				103,000	10,220							28
				14,100	1,540					24,532	4,967	29
				338,677	43,531			10,000	12,500	320,924	80,927	30
				82,172	10,901	100	30			22,940	4,805	31
				12,260	1,302					18,949	3,873	32
				79,245	8,905					41,078	26,244	33
				1,000	100					250	50	34

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES.	MATERIALS USED—continued.							
		Yarns not made in mill—Continued.							
		Mohair.		Silk.		Spun silk.		Jute.	
		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
1	The United States	324,181	$297,995	120,571	$632,545	69,358	$281,211	125,327	$13,181
2	Alabama								
3	Arkansas								
4	California	955	1,099						
5	Connecticut	2,445	3,105	13,238	98,141	4,179	16,246	25,000	1,750
6	Delaware								
7	Georgia								
8	Illinois								
9	Indiana			129	555				
10	Iowa								
11	Kentucky								
12	Maine					3,384	5,565		
13	Maryland								
14	Massachusetts	23,000	23,800	16,989	118,221	9,285	62,628	7,207	609
15	Michigan								
16	Minnesota								
17	Mississippi								
18	Missouri								
19	New Hampshire			1,003	8,844	341	1,660		
20	New Jersey			500	4,100	1,109	12,230		
21	New York	35,000	35,500	6,225	44,910	2,268	10,520	500	70
22	North Carolina								
23	Ohio							3,000	300
24	Oregon			10	57				
25	Pennsylvania	237,521	207,043	42,966	248,842	25,568	108,362	89,620	10,452
26	Rhode Island	25,260	27,448	39,111	104,875	23,224	64,000		
27	Tennessee								
28	Texas								
29	Utah								
30	Vermont								
31	Virginia								
32	West Virginia								
33	Wisconsin			400	4,000				
34	All other states								

AND TERRITORIES: 1890—Continued.

MATERIALS USED—continued.

Yarns not made in mill—Continued.		Oil.		Soap.		Chemicals and dye-stuffs.	Fuel.			Rent of power and heat.	All other materials.	
Linen.							Total cost.	Coal.	Wood.			
Pounds.	Cost.	Gallons.	Cost.	Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost.	
2,529	$895	2,439,573	$773,839	18,572,964	$614,997	$3,213,929	$1,711,169	$1,528,206	$182,961	$108,660	$2,230,554	1
		152	53			675	105		105			2
		560	165	5,300	110	50	200	200		50	20	3
		30,792	13,305	905,306	19,847	28,881	39,586	25,121	14,465		7,679	4
100	25	161,970	53,784	940,640	36,924	242,519	145,010	119,466	25,544	1,550	187,494	5
		18,350	1,144	87,011	5,221	9,071	2,410	2,410			20,512	6
		2,858	804	17,479	415	1,844	1,255		1,255		2,695	7
		21,964	7,174	349,048	11,206	28,417	20,006	20,556	50	360	5,237	8
		37,800	11,308	821,132	19,369	102,920	37,828	37,318	510	100	2,744	9
		11,225	3,881	234,510	6,081	21,202	6,432	3,913	2,519		5,786	10
		37,854	8,702	105,163	2,867	62,852	24,403	23,804	599	300	91,553	11
		139,411	42,941	1,280,993	44,317	221,643	123,910	88,152	35,758	4,598	88,401	12
		6,615	2,535	24,898	937	10,733	8,331	8,241	90		25,440	13
		581,284	204,816	5,168,346	170,237	998,468	504,361	479,662	24,699	26,744	788,790	14
		11,341	4,131	255,551	7,980	11,006	14,207	7,017	7,190	200	2,682	15
		14,508	4,098	222,180	5,689	9,238	7,462	5,577	1,885	1,642	19,025	16
		7,722	2,263	84,700	4,277	13,400	13,455	750	12,705		16,000	17
		14,909	4,060	84,950	1,877	8,215	8,862	7,792	1,070	200	6,928	18
		123,790	42,994	1,483,349	41,478	240,612	103,285	85,529	17,756	3,300	136,157	19
		104,318	35,183	1,075,836	34,568	152,295	69,126	69,126		2,425	48,643	20
500	330	96,839	28,125	680,957	26,077	114,256	57,764	55,861	1,903	2,208	56,205	21
		3,792	1,091	49,500	1,250	4,650	1,900	400	1,500		1,952	22
		32,608	10,599	345,027	8,906	36,143	16,663	15,673	990	525	5,373	23
		14,712	4,550	165,209	6,617	27,591	5,759		5,759	250	7,000	24
1,929	540	722,675	198,558	2,140,597	89,804	547,970	274,421	273,082	1,339	43,814	522,262	25
		123,202	49,425	771,394	30,285	175,572	135,427	121,223	14,204	17,296	115,287	26
		19,594	4,737	44,502	1,272	14,823	14,650	12,523	2,127	270	1,417	27
		2,550	738	101,750	2,060	7,800	3,128	3,125	3		1,916	28
		5,041	2,221	99,150	2,892	8,492	5,048	5,038	10	450	11,930	29
		37,735	13,628	606,256	18,750	58,434	35,223	30,903	4,320	1,210	38,817	30
		18,881	5,120	110,830	2,626	14,487	4,693	3,908	785		4,827	31
		8,451	2,192	76,915	2,107	7,273	4,355	4,135	220		728	32
		25,520	9,382	231,185	8,865	29,692	19,813	16,212	3,601	927	6,812	33
		490	132	3,300	80	2,705	1,491	1,491		100	242	34

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES.	PRODUCTS.								
			All wool woven goods.							
		Aggregate value.	Total.		Cloths, doeskins, cassimeres, cheviots, indigo flannels, and broadcloths for men's wear.		Overcoatings, cloakings, and kerseys for both men's and women's wear.		Carriage cloths of all weights.	
			Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
1	The United States	$133,577,977	95,807,636	$51,205,385	23,008,903	$21,648,649	4,020,612	$4,695,723	1,282,921	$626,791
2	Alabama	17,150								
3	Arkansas	38,380	700	400						
4	California	1,325,033	1,366,651	716,576	143,102	131,745				
5	Connecticut	9,082,493	6,342,270	3,333,980	1,624,825	1,527,176	499,466	622,011	766,938	255,032
6	Delaware	482,022	327,612	310,662	263,412	263,412				
7	Georgia	173,245								
8	Illinois	1,299,506	1,646,506	1,068,636	999,959	741,248			156,000	129,500
9	Indiana	2,989,182	3,714,040	1,738,664	450,718	368,981	89,170	115,419		
10	Iowa	695,218	1,176,626	569,792	133,770	121,389	1,290	1,290		
11	Kentucky	2,351,117	29,550	24,315	2,600	2,060				
12	Maine	7,521,317	8,219,000	4,061,092	1,664,838	1,022,606	942,275	1,101,946		
13	Maryland	579,516	579,883	572,156	538,175	557,200	600	450		
14	Massachusetts	35,771,161	35,040,073	17,332,989	6,164,897	6,668,386	1,351,659	1,446,019	152,173	106,492
15	Michigan	844,652	881,329	630,626	715,146	550,164	5,000	3,400		
16	Minnesota	539,995	681,490	464,550	7,675	6,150	4,000	3,000		
17	Mississippi	924,185	9,600	4,900	6,000	3,000				
18	Missouri	548,457	556,739	200,960	6,170	4,513	630	750		
19	New Hampshire	8,004,264	8,806,591	3,287,023	1,332,066	834,236			75,519	24,919
20	New Jersey	5,652,166	1,826,871	1,887,890	1,459,695	1,503,267	139,080	171,098	5,984	7,232
21	New York	5,188,020	3,868,113	2,654,228	1,552,702	1,361,563			126,307	103,616
22	North Carolina	308,946	117,550	58,570	60,650	38,300	11,250	3,700		
23	Ohio	1,513,302	1,704,027	863,864	360,805	238,769	27,750	26,000		
24	Oregon	614,932	117,283	123,938	41,809	79,912				
25	Pennsylvania	29,878,010	10,325,818	4,255,656	1,158,019	772,149	428,353	630,514		
26	Rhode Island	9,884,945	3,502,424	4,192,508	3,142,852	3,752,008	321,572	450,000		
27	Tennessee	1,216,419	109,400	46,085	83,650	34,560				
28	Texas	359,230								
29	Utah	338,534	577,536	197,209	23,381	30,818				
30	Vermont	2,723,683	1,379,555	648,542	41,479	44,166	143,892	89,926		
31	Virginia	609,809	477,382	382,294	359,450	318,449	41,625	27,800		
32	West Virginia	328,800	479,876	200,160	104,128	56,377				
33	Wisconsin	1,669,944	1,695,381	1,278,267	565,730	635,645	3,000	2,400		
34	All other states	104,364	247,760	98,802	1,200	400				

AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.											
All wool woven goods—Continued.											
Dress goods, sackings, tricots, ladies' cloth, broadcloth, and all other goods for women's wear.		Flannels.		Blankets.		Horse blankets.		Carriage robes.		Woven shawls, wool or worsted.		
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
24. 60s. 977	$8,769,257	32,762,273	$10,458,557	4,666,057	$2,532,324	666,625	$357,411	257,298	$145,019	4,533,970	$1,971,654	1
												2
				700	400							3
		918,105	370,931	305,444	213,900							4
1,644,207	566,949	1,806,834	362,812									5
				64,200	47,250							6
												7
		63,496	26,785	185,851	73,559			684	457	240,516	97,087	8
20,300	9,600	2,686,098	970,098	467,754	274,566							9
		752,656	308,744	288,910	138,369							10
		3,800	1,420	23,150	20,835							11
2,442,244	841,419	2,677,355	807,895	27,055	16,211	165,149	125,560	11,280	4,324	288,804	141,131	12
		35,058	10,906	5,550	3,200	500	400					13
16,379,781	5,607,708	10,548,599	3,244,724	32,515	37,282	1,319	1,364	17,060	10,312	392,070	210,702	14
400	160	101,691	48,367	58,192	28,175	900	360					15
		168,372	62,474	501,443	392,926							16
				3,600	1,900							17
		275,090	70,621	273,949	124,476			900	600			18
2,828,282	958,936	4,240,311	1,302,253	315,119	161,503			15,314	5,176			19
		1,112	463	500	330	90,000	75,000			130,500	130,500	20
1,500	900	1,501,870	910,300	49,500	26,385	300	213	45,000	40,000	590,934	211,251	21
		24,700	6,620	20,950	9,950							22
6,818	3,072	610,016	203,379	413,418	254,479	135,000	63,000	150,000	75,000	220	165	23
		49,056	24,761	21,798	16,492					4,620	2,773	24
837,465	556,713	3,986,916	828,273	1,045,031	441,082	273,457	91,514	17,060	9,150	2,569,517	926,261	25
28,000	7,000	10,000	3,500									26
		11,300	3,850	14,450	7,675							27
												28
		297,411	99,501	244,391	58,714					12,353	8,227	29
420,000	216,800	648,184	246,650	126,000	51,000							30
		25,150	8,760	51,157	27,285							31
		340,218	128,643	35,530	15,140							32
		734,355	308,325	87,860	88,340					304,436	243,557	33
		244,520	97,502	2,040	900							34

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES.	PRODUCTS—continued.							
		Union or cotton mixed woven goods.							
		Total.		Unions, tweeds, cheviots, cassimeres, and other goods for men's wear.		Overcoatings and cloakings.		Sackings, tricots, and dress goods for women's wear.	
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
1	The United States	54,385,108	$23,009,976	20,023,283	$12,103,503	3,528,942	$2,497,092	9,892,377	$2,532,598
2	Alabama								
3	Arkansas	5,850	2,110						
4	California	1,754,649	601,032	74,670	61,583				
5	Connecticut	6,103,276	3,685,312	4,189,326	2,999,552	145,822	166,369	1,373,334	421,501
6	Delaware	1,080,000	162,000	1,080,000	162,000				
7	Georgia	13,774	3,673	13,774	3,673				
8	Illinois	578	500						
9	Indiana	411,048	142,066	1,500	1,700				
10	Iowa								
11	Kentucky								
12	Maine	3,842,467	1,335,243	401,869	266,281	160,425	101,533	2,790,566	800,234
13	Maryland	300	200	300	200				
14	Massachusetts	12,655,898	5,278,427	3,605,066	2,719,290	691,257	599,571	4,833,284	1,097,540
15	Michigan	1,050	360						
16	Minnesota								
17	Mississippi	2,250	450						
18	Missouri	521,174	99,497	520,684	99,302				
19	New Hampshire	5,118,629	1,888,932	860,525	549,798	557,300	438,000	346,083	92,202
20	New Jersey	3,671,300	2,178,644	1,885,600	1,103,397	1,565,700	895,247		
21	New York	3,047,057	1,422,239	401,782	313,506	20,000	18,000	304,625	69,350
22	North Carolina	1,125	330						
23	Ohio	2,700	1,754	700	254				
24	Oregon	483,884	161,040	21,809	29,302				
25	Pennsylvania	11,101,112	3,061,144	3,879,195	1,353,743	186,778	103,600	97,238	20,674
26	Rhode Island	1,353,272	1,292,383	1,353,272	1,292,383				
27	Tennessee	28,265	6,063						
28	Texas	338,000	181,000	240,000	140,000				
29	Utah	171,432	64,569						
30	Vermont	2,072,547	1,199,453	1,120,137	832,431	201,660	174,772	15,750	5,250
31	Virginia	88,410	66,280	83,310	64,220				
32	West Virginia	94,200	28,780	400	240				
33	Wisconsin	420,861	136,495	289,364	110,648			131,497	25,847
34	All other states								

AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.												
Union or cotton mixed woven goods—Continued.						Goods woven on cotton warps, weft partly or wholly of wool or hair.						
Flannels and linseys.		Blankets.		Horse blankets.		Total.		Cassimeres, doeskins, coatings, suitings, and other goods for men's wear.		Overcoatings and cloakings.		
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
11. 621. 679	$3, 314. 733	4, 804, 390	$1. 390, 660	4, 514, 437	$1, 171, 390	111, 027, 431	$37, 199, 986	27, 882. 734	$13, 273, 684	4, 814, 969	$3, 387, 061	1
						22, 500	10, 800					2
3. 450	1. 150	2, 400	960			51, 200	16, 000					3
1. 547. 187	448, 385	121, 030	84, 080	11, 762	6, 984	13. 500	7, 425					4
300, 000	67, 500			94, 794	40, 390	4. 654. 472	1, 548, 614	880, 717	513, 786	95, 847	98, 581	5
												6
						500, 002	149. 372					7
		578	500			502, 778	178. 550	422, 159	105, 500			8
255. 676	78. 804	153, 872	61, 562			2, 691, 917	694. 100	1, 665, 944	330, 994			9
						54, 335	28, 378	12, 000	8, 745			10
						6, 983, 577	2, 084. 492	1, 447, 643	529, 958			11
38. 038	13, 089	390, 937	132, 122	60, 632	21, 984	5, 445, 247	1, 862, 348	1, 047, 104	577, 138	97, 555	89, 809	12
												13
2. 772. 570	728, 830	669, 871	101, 596	83. 850	31, 600	29, 852. 055	10, 330, 678	3, 909, 070	3, 091, 971	1, 663, 919	1, 529, 907	14
1. 050	360					20, 050	9. 465					15
												16
2. 250	450					1, 672, 167	864, 760					17
490	195					183, 830	50, 835					18
2 082. 057	510. 727			1. 292. 664	298. 205	6, 334. 944	2. 525, 856	1, 594, 726	943, 483	623, 885	399, 800	19
		220, 000	180, 000			2, 107, 130	1, 089, 596	558, 300	391, 504	959, 050	391, 422	20
1. 729. 000	911, 550			591, 650	109, 833	1, 056, 643	419, 361	19, 200	10, 450	376, 405	183, 874	21
1, 125	330					644, 027	146, 440	225, 927	83, 160	312, 000	21, 060	22
		2, 000	1, 500			434, 005	249, 652	1, 600	1, 100	45	68	23
462, 075	131, 738					451. 995	310, 103	135, 144	153, 743			24
1. 441. 354	140, 564	3, 117, 462	780, 169	2, 379. 085	662, 394	36, 406, 275	10, 248. 727	10, 618, 421	3, 990, 106	269, 410	359. 057	25
						4, 751, 539	2, 374, 404	3, 667, 498	1, 913, 511	416, 873	313, 483	26
2. 225	542	26, 040	5, 521			3, 523, 455	995, 467	1. 141, 100	300, 650			27
		98, 000	41, 000			360, 000	126, 000					28
169. 832	63. 369	1, 600	1, 200			86, 479	33, 986	20, 147	3, 050			29
735. 000	187. 000					1, 987, 060	764, 876	488, 084	311, 455			30
4. 500	1. 610	600	450			207, 205	69, 065	24, 575	11, 520			31
93. 800	28. 540					27. 344	9. 796	3, 375	1. 860			32
												33
						1, 700	840					34

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES.	PRODUCTS—continued.							
		Goods woven on cotton warps, weft partly or wholly of wool or hair—Continued.							
		Satinets.		Wool-filling dress goods and repellents.		Flannels and shirtings.		Blankets.	
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
1	The United States	18,619,181	$4,287,778	17,150,803	$4,184,262	16,729,685	$4,782,829	8,703,822	$2,546,338
2	Alabama								
3	Arkansas	1,500	600					1,000	300
4	California							13,500	7,425
5	Connecticut	1,078,760	289,466	1,594,451	428,119	948,834	203,246	55,863	15,416
6	Delaware								
7	Georgia								
8	Illinois	1,500	725			600	300	73,419	70,000
9	Indiana	3,111	2,609			315,909	165,675	8,448	5,748
10	Iowa							9,060	4,758
11	Kentucky							370	200
12	Maine	6,600	3,950	2,687,510	679,281	554,000	133,480	1,052,103	378,190
13	Maryland								
14	Massachusetts	15,996,900	3,538,217	1,729,076	286,748	2,569,569	979,430	3,982,561	903,925
15	Michigan	2,600	1,690			2,100	720	14,350	6,805
16	Minnesota								
17	Mississippi								
18	Missouri	480	440					6,850	1,950
19	New Hampshire	264,000	27,720	1,949,076	559,334	819,577	210,783	1,083,680	384,736
20	New Jersey			148,680	54,500			441,100	252,170
21	New York	300	200			312,538	140,737	278,200	44,100
22	North Carolina	27,850	9,790					19,200	10,000
23	Ohio	8,983	6,368			56,230	19,512	13,000	14,820
24	Oregon							316,851	156,360
25	Pennsylvania	36,385	18,082	8,874,413	2,142,327	10,270,155	2,708,121	1,298,722	276,150
26	Rhode Island	440,872	99,151	166,296	33,259				
27	Tennessee					52,500	30,000	2,850	2,125
28	Texas								
29	Utah					23,635	9,454		
30	Vermont	747,738	287,660			751,238	165,761		
31	Virginia					49,225	14,150	22,215	8,600
32	West Virginia	1,400	980	1,301	694	3,375	1,350	9,180	1,960
33	Wisconsin								
34	All other states	200	130			200	110	1,300	600

AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.

Goods woven on cotton warps, weft partly or wholly of wool or hair—Continued.		Upholstery goods and sundries—woolen.	All worsted woven goods.						
Jeans, kerseys, and linseys.			Total.		Coatings, serges, and suitings for men's wear.		Dress goods, cassimeres, serges, and other goods for women's wear.		
Square yards.	Value.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
17,126,217	$4,738,034	$133,600	3,048,248	$2,626,174	2,030,928	$2,245,287	1,017,320	$380,887	1
22,500	10,800								2
48,700	15,100								3
									4
		65,000	254,382	409,973	253,692	409,513	690	460	5
									6
500,002	149,372								7
5,100	2,025								8
698,505	189,074								9
33,275	14,875								10
5,535,564	1,554,334								11
375	500		900	1,350	900	1,350			12
									13
960	480		619,312	795,616	619,312	795,616			14
1,000	250								15
									16
1,672,167	864,760								17
176,500	48,445								18
			146,561	225,438	146,561	225,438			19
			163,050	92,700	57,050	41,500	106,000	51,200	20
70,000	40,000	40,000							21
59,050	22,430								22
354,145	207,784								23
									24
5,033,769	754,884		1,160,630	769,227	900,000	700,000	260,630	69,227	25
60,000	15,000	28,600	703,413	331,870	53,413	71,870	650,000	260,000	26
2,327,005	662,692								27
360,000	126,000								28
42,697	21,482								29
									30
111,190	34,795								31
8,713	2,952								32
									33
									34

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES.	PRODUCTS—continued.							
		Goods woven on cotton warps, weft partly or wholly of wool or hair—Continued.							
		Satinets.		Wool-filling dress goods and repellents.		Flannels and shirtings.		Blankets.	
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
1	The United States	18,619,181	$4,287,778	17,150,803	$4,184,262	16,729,685	$4,782,829	8,703,822	$2,546,338
2	Alabama								
3	Arkansas	1,500	600					1,000	300
4	California							13,500	7,425
5	Connecticut	1,078,760	289,466	1,594,451	428,119	948,834	203,246	55,863	15,416
6	Delaware								
7	Georgia								
8	Illinois	1,500	725			600	300	73,419	70,000
9	Indiana	3,111	2,609			315,909	165,675	8,448	5,748
10	Iowa							9,060	4,758
11	Kentucky							370	200
12	Maine	6,600	3,950	2,687,510	679,281	554,000	133,480	1,052,103	378,190
13	Maryland								
14	Massachusetts	15,996,900	3,538,217	1,729,076	286,748	2,569,569	979,430	3,982,561	903,925
15	Michigan	2,600	1,690			2,100	720	14,350	6,805
16	Minnesota								
17	Mississippi								
18	Missouri	480	440					6,850	1,950
19	New Hampshire	264,000	27,720	1,949,076	559,334	819,577	210,783	1,083,680	384,736
20	New Jersey			148,680	54,500			441,100	252,170
21	New York	300	200			312,538	140,737	278,200	44,100
22	North Carolina	27,850	9,790					19,200	10,000
23	Ohio	8,985	6,368			56,230	19,512	13,000	14,820
24	Oregon							316,851	156,360
25	Pennsylvania	36,385	18,062	8,874,413	2,142,327	10,270,155	2,708,121	1,298,722	276,150
26	Rhode Island	440,872	99,151	166,296	33,259				
27	Tennessee					52,500	30,000	2,850	2,125
28	Texas								
29	Utah					23,635	9,454		
30	Vermont	747,738	287,660			751,238	165,761		
31	Virginia					49,225	14,150	22,215	8,600
32	West Virginia	1,400	980	1,301	694	3,375	1,350	9,180	1,960
33	Wisconsin								
34	All other states	200	130			200	110	1,300	600

AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.									
Goods woven on cotton warps, weft partly or wholly of wool or hair—Continued.		Upholstery goods and sundries—woolen.	All worsted woven goods.						
Jeans, kerseys, and linseys.			Total.		Coatings, serges, and suitings for men's wear.		Dress goods, cassimeres, serges, and other goods for women's wear.		
Square yards.	Value.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
17,126,217	$4,738,034	$133,600	3,048,248	$2,626,174	2,030,928	$2,245,287	1,017,320	$380,887	1
22,500	10,800								2
48,700	15,100								3
									4
		65,000	254,382	409,973	253,692	409,513	690	460	5
									6
500,002	149,372								7
5,100	2,025								8
606,505	189,074								9
33,275	14,875								10
5,535,564	1,554,334								11
375	500		900	1,350	900	1,350			12
									13
960	480		619,312	795,616	619,312	795,616			14
1,000	250								15
									16
1,672,167	864,760								17
176,500	48,445								18
			146,561	225,438	146,561	225,438			19
			163,050	92,700	57,050	41,500	106,000	51,200	20
70,000	40,000	40,000							21
59,050	22,430								22
354,145	207,784								23
									24
5,033,769	754,884		1,160,630	769,227	900,000	700,000	260,630	69,227	25
60,000	15,000	28,600	703,413	331,870	53,413	71,870	650,000	260,000	26
2,327,005	662,692								27
360,000	126,000								28
42,697	21,482								29
									30
111,190	34,795								31
8,713	2,952								32
									33
									34

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES.	PRODUCTS—continued.							
		Goods woven on cotton warps, weft partly or wholly of worsted.							
		Total.		Cassimeres, doeskins, coatings, suitings, and other goods for men's wear.		Worsted filling dress goods, delaines, cashmeres, serges and other stuffs for women's wear.		Linings, Italian cloths, and lastings.	
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
1	The United States	5,268,142	$2,000,031	568,597	$563,225	3,531,356	$990,904	1,168,189	$445,902
2	Alabama								
3	Arkansas								
4	California								
5	Connecticut	23,000	5,250					23,000	5,250
6	Delaware								
7	Georgia								
8	Illinois								
9	Indiana	14,784	3,929					14,784	3,929
10	Iowa								
11	Kentucky								
12	Maine	395,064	134,322					395,064	134,322
13	Maryland								
14	Massachusetts	1,328,984	753,501	303,537	304,096	330,106	153,804	695,341	295,601
15	Michigan								
16	Minnesota								
17	Mississippi								
18	Missouri								
19	New Hampshire								
20	New Jersey								
21	New York								
22	North Carolina								
23	Ohio								
24	Oregon								
25	Pennsylvania	831,250	258,300	150,000	80,000	641,250	171,500	40,000	6,800
26	Rhode Island	2,617,600	766,200	57,600	100,600	2,560,000	665,600		
27	Tennessee								
28	Texas								
29	Utah								
30	Vermont	57,460	78,529	57,460	78,529				
31	Virginia								
32	West Virginia								
33	Wisconsin								
34	All other states								

AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.									
Upholstery goods and sundries—worsted.	Carpets and rugs.	Felt goods.	Wool hats.	Hosiery and knit goods.	Partly manufactured products for sale.				
					Total.		Woolen yarn, all wool.		
Value.	Value.	Value.	Value.	Value.	Pounds.	Value.	Pounds.	Value.	
$1,330,332	$7,334	$22,815	$300	$97,770	48,077,114	$14,304,804	30,768,571	$8,990,106	1
					17,459	6,350			2
					38,500	19,850	6,000	3,600	3
									4
					137,600	24,364	19,000	10,150	5
					78,000	9,360			6
					39,850	20,160			7
				1,500	89,391	50,220	66,891	38,420	8
				8,425	1,137,055	400,848	376,055	217,398	9
				2,500	140,648	94,548	128,248	88,548	10
					430,892	242,310	240,556	140,613	11
					428,855	126,962	17,950	10,840	12
	700				10,796	6,460	8,796	5,460	13
88,285		6,000		8,000	3,021,933	1,140,797	1,218,415	716,770	14
				12,409	341,332	184,592	240,144	135,244	15
					136,700	75,445	63,150	39,525	16
					99,200	54,075	85,500	47,325	17
				183	350,709	196,982	247,023	146,403	18
3,000					199,200	73,925	100,000	51,840	19
125,000					677,391	278,136	627,391	258,136	20
98,000				50	743,867	371,042	316,290	136,913	21
					254,372	103,606	122,000	66,650	22
	60	1,200		3,082	635,582	392,720	582,805	365,441	23
				15,267	8,816	4,584	216	194	24
911,957	6,374	15,615	300	5,765	36,018,277	8,944,048	24,835,968	5,564,624	25
106,000				40,000	1,627,720	752,980	638,300	471,890	26
					382,611	108,804	146,844	76,557	27
					87,460	52,230	85,300	51,150	28
					66,084	41,184	53,372	37,110	29
					57,366	30,283	13,000	11,250	30
	200				177,499	91,970	128,991	72,100	31
					162,006	89,904	121,906	69,704	32
					453,872	252,307	275,760	148,251	33
				589	6,080	3,758	2,700	2,000	34

TABLE 5.—WOOLEN MILLS, BY STATES

	STATES AND TERRITORIES	PRODUCTS—continued.							
		Partly manufactured products for sale—Continued.							
		Woolen yarn, union or merino.		Worsted yarn.		Cotton yarn.		Woolen card rolls.	
		Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1	The United States	6,670,757	$2,253,792	2,673,546	$1,206,927	3,159,047	$626,072	1,435,215	$704,581
2	Alabama					7,000	1,120	10,459	5,230
3	Arkansas							32,500	16,250
4	California								
5	Connecticut	7,000	1,610						
6	Delaware	78,000	9,360						
7	Georgia							39,750	20,125
8	Illinois	2,000	1,600					20,500	10,200
9	Indiana	35,000	14,000			682,000	150,000	39,000	19,400
10	Iowa							11,800	5,900
11	Kentucky							190,336	95,697
12	Maine			6,500	5,221	178,499	28,628	153,306	76,013
13	Maryland							2,000	1,000
14	Massachusetts	422,961	156,941	166,746	108,385	70,998	20,329		
15	Michigan							99,438	49,223
16	Minnesota							71,550	34,840
17	Mississippi							13,700	6,750
18	Missouri	2,500	1,875					99,186	48,354
19	New Hampshire	3,600	1,440					30,600	14,320
20	New Jersey	50,000	20,000						
21	New York	291,583	183,112					96,459	47,227
22	North Carolina					81,000	13,365	50,372	23,341
23	Ohio							52,777	27,279
24	Oregon							8,600	4,390
25	Pennsylvania	5,712,413	1,830,589	2,161,000	943,321	1,886,630	356,188	89,716	40,649
26	Rhode Island	64,800	32,400	187,300	160,000	181,920	45,480		
27	Tennessee					70,000	10,362	164,817	81,795
28	Texas							2,160	1,080
29	Utah							12,712	4,074
30	Vermont							37,366	18,233
31	Virginia	900	865					35,599	17,805
32	West Virginia							40,100	20,200
33	Wisconsin			150,000	90,000			28,112	14,056
34	All other states					1,000	600	2,300	1,150

a Includes items as follows: cottonades, $249,839; cotton batts, $1,575; cotton cassimeres, doeskins, $267,176; cotton cloths, $36,000; cotton dusters, $35,000; cotton jeans, kerseys, etc., $27,298; cotton lap dusters, $80,000; cotton piece goods, $254,120; cotton shirtings, $238,085; custom work, $52,445; dyeing, $1,586; flannel shirts,

AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.									
Partly manufactured products for sale—Continued.								All other products. (a)	
Worsted slubbing and noils.		Waste.		Shoddy and mungo.		Wool extract.			
Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.	
76,400	$31,840	1,085,178	$180,425	1,583,300	$179,351	625,100	$31,710	$1,639,470	1
									2
									3
									4
				111,600	12,604				5
									6
		100	35					40	7
								100	8
		5,000	50					1,150	9
		500	50			100	50		10
									11
		72,600	6,260						12
									13
		442,813	61,372	700,000	77,000			36,868	14
		1,750	125					7,200	15
						2,000	1,080		16
									17
		1,500	150			500	200		18
				65,000	6,325				19
								200	20
		39,535	3,790					185,100	21
		1,000	250						22
								970	23
									24
		463,350	101,375	679,200	80,262	208,000	27,040	1,400,897	25
76,400	31,840	44,000	5,570	20,500	2,460	414,500	3,340		26
		950	90						27
									28
								1,535	29
		7,000	800					2,000	30
		5,000	500	7,000	700				31
								160	32
								2,875	33
		80	8					375	34

$10,000: fly nets, $27,300; ginghams, $53,750; listings, $2,000; pickings, $69,250; scouring wool, $32,500; stockinets, $450; woolen batts, $3,482; woolen silk yarn, $175,000; miscellaneous, $22,714.

TABLE 6.—WORSTED MILLS,

	STATES.	Number of establishments.	CAPITAL.								
				Direct investment.							
					Value of plant.				Live assets.		
			Value of hired property.	Aggregate.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	143	$4,109,526	$68,085,116	$27,890,810	$2,842,769	$7,962,865	$17,085,176	$40,194,306	$10,844,736	$15,606,658	$13,742,912
2	Connecticut	10	.....	5,263,201	1,905,153	239,666	570,400	1,095,087	3,358,048	583,981	975,544	1,798,523
3	Massachusetts	33	800,100	21,204,909	8,728,179	1,007,575	2,775,173	4,945,431	12,476,730	3,204,626	5,371,979	3,900,125
4	New Hampshire	4	.....	4,295,688	1,125,440	69,000	197,000	859,440	3,170,248	603,278	1,252,304	1,314,666
5	New Jersey	6	75,000	1,305,271	653,472	38,500	181,500	433,472	651,799	210,661	174,375	266,763
6	New York	16	245,000	5,615,875	2,085,099	247,509	485,968	1,351,622	3,530,776	980,056	1,675,819	874,901
7	Pennsylvania	41	1,794,700	13,929,489	5,432,681	522,500	1,290,684	3,619,497	8,496,808	2,393,752	2,881,667	3,221,389
8	Rhode Island	28	1,161,726	14,949,166	7,240,767	657,519	2,273,205	4,310,045	7,708,399	2,677,811	2,959,159	2,071,429
	All other states (b)	5	33,000	1,521,517	720,019	60,500	188,937	470,582	801,498	190,571	315,811	295,116

	STATES.	MACHINERY—continued.								MATERIALS USED.		
		Spindles.			Power looms.						Foreign wool in condition purchased.	
		Woolen.	Worsted.	Cotton.	Total number of power looms.	Broad looms on woolen goods.	Broad looms on worsted goods.	Narrow looms on woolen goods.	Narrow looms on worsted goods.	Hand looms.	Knitting machines.	Total cost.	Pounds.	Cost.
10	The United States	207,180	479,675	68,225	19,044	1,366	7,445	297	9,936	51	32	$50,706,769	37,869,023	$10,591,129
11	Connecticut	29,100	8,932	.....	827	51	676	.....	100	.....	.....	2,814,186	877,903	354,389
12	Massachusetts	38,262	151,558	14,690	6,488	301	1,633	.....	4,554	.....	.....	14,259,116	16,197,664	4,123,616
13	New Hampshire	2,416	21,184	.....	2,074	12	38	.....	2,024	.....	.....	2,080,295	4,191,453	1,109,490
14	New Jersey	.....	17,648	.....	81	50	20	.....	11	.....	.....	1,417,167	465,481	182,674
15	New York	23,827	40,552	.....	1,512	194	605	5	708	26	6	3,470,580	1,298,049	440,894
16	Pennsylvania	51,035	104,169	31,615	3,271	498	1,294	291	1,188	23	26	11,539,880	6,632,146	1,604,230
17	Rhode Island	58,080	131,424	21,920	4,369	160	3,037	1	1,171	.....	.....	13,932,912	7,406,327	2,600,836
18	All other states	4,460	4,208	.....	422	100	142	.....	180	.....	.....	1,192,633	800,000	175,000

	STATES.	MATERIALS USED—continued.									
		Yarns not made in mill.									
		Woolen.		Worsted.		Cotton.		Mohair.		Silk.	
		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
19	The United States	903,174	$355,592	11,551,264	$11,814,625	9,454,874	$2,441,972	232,071	$212,364	46,138	$344,556
20	Connecticut	.....	.....	1,550,697	1,735,603	328,500	70,500	126	1[illegible]	4,285	44,346
21	Massachusetts	19,078	15,060	2,711,220	2,935,931	2,578,066	833,947	71,990	97,556	2,218	18,480
22	New Hampshire	.....	.....	151,200	138,080	1,398,758	280,634	.....	.....	.....	.....
23	New Jersey	97,480	63,362	219,230	254,999	20,000	4,000	40,000	6,000	1,514	2,271
24	New York	.....	.....	683,885	647,760	720,645	196,265	.....	.....	9,048	64,709
25	Pennsylvania	376,116	144,020	2,871,376	2,683,644	3,462,691	800,421	114,345	92,746	11,846	71,900
26	Rhode Island	410,500	133,150	3,275,906	3,308,920	419,014	136,650	5,610	15,916	17,227	142,850
27	All other states	.....	.....	87,750	109,688	527,200	119,555	.....	.....	.....	.....

a Includes officers, firm members, and clerks. For detailed information see Table 12.

BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		MACHINERY			
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	Cards. (Sets.)	Combing machines.		
										Foreign.	American.	
$4,917,760	$296,237	$267,713	$250,385	$808,820	$1,595,813	$1,698,792	43,593	$15,880,183	953	544	129	1
405,389	.....	15,784	26,252	22,480	149,280	191,573	2,261	875,372	96	7	.....	2
1,491,042	78,506	121,349	66,612	334,243	454,924	435,408	12,021	4,556,997	238	177	45	3
129,869	.....	22,575	13,943	1,000	72,031	20,320	1,963	678,552	29	25	4	4
91,406	4,900	2,195	4,869	8,850	38,761	31,831	954	284,102	21	21	2	5
342,073	15,830	20,751	13,457	61,355	162,738	67,942	3,953	1,481,194	96	36	14	6
975,930	127,141	23,763	57,678	180,664	181,063	405,621	9,453	3,350,113	207	141	9	7
1,337,472	67,860	57,833	56,461	175,818	517,819	461,681	12,75[illegible]	4,263,968	247	128	48	8
144,599	2,000	3,463	11,113	24,410	19,197	84,416	1,231	389,885	19	9	7	9

MATERIALS USED—continued.

Domestic wool in condition purchased.		Total foreign and domestic wool in scoured pounds.	Shoddy.		Waste and wool noils.		Camel's hair and noils.		Mohair and noils.		All other animal hair.		Raw cotton.		
Pounds.	Cost.		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	
56,632,451	$17,689,158	54,989,746	2,608,831	$347,006	1,391,444	$466,648	4,411,543	$672,392	2,038,732	$824,869	1,083,690	$120,585	1,881,743	$438,637	10
492,211	222,151	796,054	69,000	10,860	6,096	3,054	147	66	220,000	88,000	.....	.....	6,000	1,150	11
11,981,862	4,092,690	15,860,091	398,288	74,743	132,763	28,082	3,321,439	456,559	703,506	294,819	2,113	898	869,053	96,998	12
1,080,527	275,333	3,020,166	163,600	20,788	.....	.....	15,000	2,700	.....	.....	.....	.....	150,400	18,044	13
2,655,886	821,883	1,704,433	100,000	5,000	15,000	5,000	.....	.....	.....	.....	.....	.....	50,000	6,500	14
5,293,237	1,584,526	4,107,493	9,497	1,788	128,841	24,502	565,000	116,250	6,763	3,191	.....	.....	.....	.....	15
15,659,877	4,606,687	14,434,400	1,425,785	149,697	446,227	123,898	266,865	49,699	399,153	167,503	468,616	28,990	1,367,085	144,262	16
18,534,803	5,793,241	13,821,280	364,661	72,430	652,767	278,992	132,092	33,798	109,310	43,356	12,961	697	1,341,705	160,958	17
1,161,048	292,647	1,245,829	78,000	11,700	9,750	3,120	111,000	13,320	600,000	228,000	600,000	90,000	97,500	10,725	18

MATERIALS USED—continued.

Yarns not made in mill—Continued.				Oil.		Soap.		Chemicals and dyestuffs.	Fuel.			Rent of power and heat.	All other materials.	
Spun silk.		Linen.							Total cost.	Coal.	Wood.			
Pounds.	Cost.	Pounds.	Cost.	Gallons.	Cost.	Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost.	
19,427	$127,775	100,350	$50,473	664,750	$258,476	9,486,021	$333,288	$1,445,965	$1,048,245	$1,026,320	$21,925	$62,427	$1,060,587	19
74	857	.....	.....	26,363	14,124	542,719	20,214	116,923	63,513	61,390	2,123	.....	68,290	20
1,289	26,386	.....	.....	154,015	62,694	2,998,509	99,689	394,551	338,540	338,133	407	24,214	243,663	21
.....	.....	.....	.....	11,435	4,679	911,969	20,482	58,650	88,219	84,944	3,275	7,965	55,231	22
.....	.....	.....	.....	20,779	8,489	152,167	6,711	13,140	18,905	18,905	.....	600	17,633	23
100	400	100,350	50,473	29,478	12,082	684,058	38,958	177,287	62,249	62,249	.....	2,648	46,598	24
14,687	90,181	.....	.....	205,983	79,949	1,938,891	68,055	209,937	165,491	165,491	.....	14,380	244,190	25
1,297	9,951	.....	.....	193,717	69,371	1,501,478	58,772	417,155	279,412	274,412	5,000	12,620	363,837	26
.....	.....	.....	.....	22,980	7,088	756,230	20,407	58,322	31,916	20,796	11,120	.....	21,145	27

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Kentucky, 2; Maine, 1; Ohio, 1; Wisconsin, 1.

TABLE 6.—WORSTED MILLS,

	STATES.	PRODUCTS.											
		Aggregate value.	All worsted woven goods.								Goods woven on cotton warps, weft partly or wholly of worsted.	
			Total.		Coatings, serges, and suitings for men's wear.		Dress goods, cassimeres, serges, and other goods for women's wear.		Buntings.		Total.	
			Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
1	The United States	$79,194,652	26,459,038	$23,801,659	15,560,159	$20,141,165	10,331,999	$3,524,511	566,880	$135,983	72,753,678	$21,592,053
2	Connecticut	4,651,402	2,660,351	4,015,498	2,660,351	4,015,498					139,500	125,000
3	Massachusetts	21,933,775	7,176,803	5,909,348	3,616,852	4,654,837	2,993,071	1,118,528	566,880	135,983	34,755,183	6,778,866
4	New Hampshire	2,764,976									13,772,125	2,403,120
5	New Jersey	2,058,662	171,428	239,999	171,428	239,999					225,000	150,000
6	New York	5,763,102	1,722,896	1,834,785	1,722,896	1,834,785					2,691,179	1,026,716
7	Pennsylvania	17,861,776	2,105,712	1,906,731	1,391,334	1,575,950	714,378	330,781			8,327,386	4,690,864
8	Rhode Island	22,319,684	12,621,848	9,895,298	5,997,298	7,820,096	6,624,550	2,075,202			10,624,890	5,723,737
9	All other states	1,841,275									2,218,425	693,750

	STATES.	PRODUCTS—continued.											
		All wool woven goods—Continued.											
		Cloths, doeskins, cassimeres, cheviots, indigo flannels, and broadcloths for men's wear.		Overcoatings, cloakings, and kerseys for both men's and women's wear.		Dress goods, sackings, tricots, ladies' cloth, broadcloth, and other goods for women's wear.		Flannels.		Blankets.		Horse blankets.		Carriage robes.	
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
10	The United States	2,258,947	$2,067,982	806,155	$1,050,292	628,413	$245,220	17,182	$2,662	356,000	$141,250	97,548	$52,258	411,303	$422,835
11	Connecticut			92,500	178,000										
12	Massachusetts	181,088	208,062	5,650	5,651	607	349	13,000	780					147,589	20,692
13	New Hampshire														
14	New Jersey			113,334	136,001										
15	New York	815,589	747,219	98,732	148,241	7,266	3,336								
16	Pennsylvania	406,820	259,694	276,423	325,296	620,540	241,535	4,182	1,882	356,000	141,250	97,548	52,258		
17	Rhode Island	855,450	853,007	219,516	257,103									4,454	4,501
18	All other states													259,260	397,642

	STATES.	PRODUCTS—continued.											
		Goods woven on cotton warps, weft partly or wholly of wool or hair—Continued.								Felt cloth.		Partly manufactured products for sale.	
		Overcoatings and cloakings.		Wool-filling dress goods and repellents.		Flannels and shirtings.		Blankets.				Total.	
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Pounds.	Value.
19	The United States	863,009	$808,614	505,000	$89,750	33,390	$6,104	2,225,707	$522,328	1,009	$1,524	36,052,126	$23,529,514
20	Connecticut									1,009	1,524	209,030	24,851
21	Massachusetts	306,348	296,426									13,827,404	7,803,844
22	New Hampshire											918,412	309,206
23	New Jersey											1,791,933	1,532,662
24	New York											1,582,981	846,880
25	Pennsylvania	508,661	440,188	505,000	89,750	33,390	6,104	1,587,360	369,308			10,956,323	7,841,563
26	Rhode Island	48,000	72,000									6,368,258	4,918,987
27	All other states							638,347	153,020			397,785	251,521

a Includes items as follows: custom work, $3,514; fire hose, $225,000; oil press cloth, $41,500; scouring wool, $4,292; shorts, $806; sweepings, burs, and springs, $1,179.

BY STATES: 1890—Continued.

PRODUCTS—continued.

Goods woven on cotton warps, weft partly or wholly of worsted—Continued.						Upholstery goods and sundries—worsted.								All wool woven goods.		
Cassimeres, doeskins, coatings, suitings, and other goods for men's wear.		Worsted filling, dress goods, delaines, cassimeres, serges, and other stuffs for women's wear.		Linings, Italian cloths, and lastings.		Total value.	Worsted or mohair goods, tapestry, plush, terry, and rep.		Braids and braiding.		Webbings, gorings, elastic fabrics, bindings, fringes, and other sundries.		Total.		
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.		Square yards.	Value.	Running yards.	Value.	Running yards.	Value.	Square yards.	Value.	
18,310,203	$9,349,901	59,026,584	$11,432,534	3,416,891	$809,618	$2,019,636	1,096,293	$1,108,344	82,430,251	$887,022	161,800	$24,270	4,800,230	$4,109,368	1
139,500	125,000					305,000	300,000	325,000					92,500	178,000	2
273,663	307,605	31,654,829	5,764,143	2,826,691	707,118	266,001			20,085,888	266,001			347,934	235,534	3
393,600	256,160	13,378,525	2,146,960												4
		225,000	150,000										113,334	136,001	5
166,530	150,794	2,590,649	875,922			119,270			4,937,240	95,000	161,800	24,270	1,043,267	980,488	6
5,773,016	3,876,323	2,054,370	752,041	500,000	62,500	453,699	522,267	338,327	16,725,373	115,372			1,777,013	1,038,365	7
3,373,669	4,340,269	7,251,211	1,383,468			530,324	60,693	119,675	40,681,750	410,649			1,166,922	1,143,338	8
256,225	293,750	1,872,000	360,000	90,200	40,000	345,342	213,333	345,342					259,260	397,642	9

PRODUCTS—continued.

All wool woven goods—Continued.		Union or cotton mixed woven goods.								Goods woven on cotton warps, weft partly or wholly of wool or hair.				
Shawls.		Total.		Unions, tweeds, cheviots, cassimeres, and other goods for men's wear.		Overcoatings and cloakings.		Horse blankets.		Total.		Cassimeres, doeskins, coatings, suitings, and other goods, for men's wear.		
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
224,662	$126,869	1,937,774	$1,294,990	1,019,000	$617,094	850,186	$644,019	68,588	$33,877	5,517,176	$2,569,617	1,890,070	$1,142,821	10
														11
		934,908	533,534	928,800	528,444	6,108	5,090			864,493	365,148	58,145	68,722	12
		70,200	52,650	70,200	52,650									13
														14
121,680	81,692									1,136,855	729,963	1,136,855	729,963	15
15,500	16,450	912,666	672,806			844,078	638,929	68,588	33,877	3,329,481	1,249,486	695,070	344,136	16
87,502	28,727	20,000	36,000	20,000	36,000					48,000	72,000			17
										638,347	153,020			18

PRODUCTS—continued.

Partly manufactured products for sale—Continued.														
Woolen yarn, wool or merino.		Worsted yarn.		Cotton yarn.		Worsted slubbing and tops.		Worsted noils.		Waste.		Shoddy and wool extract.		All other products. (a)
Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.
1,412,455	$1,221,008	24,763,501	$20,291,046	33,889	$6,777	360,101	$27,676	4,337,621	$1,433,050	3,130,693	$488,914	13,866	$1,043	$276,291	19
										209,030	24,851			1,529	20
743,845	286,795	9,776,455	6,712,844			298,427	44,764	1,649,880	486,460	1,358,797	272,081			41,500	21
253,156	58,492	665,256	250,714												22
		1,354,837	1,377,707			625	468	296,290	125,807	140,181	28,680				23
		1,026,000	681,495			50,000	32,500	367,214	117,109	139,767	15,776			225,000	24
2,355,454	839,721	7,402,656	6,624,255			11,049	9,944	926,538	316,267	246,760	50,333	13,866	1,043	8,262	25
60,000	36,000	4,140,512	4,392,510	33,889	6,777			1,097,699	387,407	1,036,158	96,293				26
		397,785	251,521												27

TABLE 7.—CARPET MILLS (OTHER

	STATES.	CAPITAL.										
				Direct investment.								
					Value of plant.				Live assets.			
		Number of establishments.	Value of hired property.	Aggregate.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	173	$1,278,150	$38,208,842	$17,375,384	$2,884,139	$5,559,458	$8,931,787	$20,833,458	$6,754,041	$5,705,756	$8,373,661
2	Massachusetts	7	.....	8,676,924	3,589,730	596,000	1,283,100	1,710,630	5,087,194	1,960,845	1,038,603	2,087,746
3	New Jersey	6	2,700	724,303	293,921	54,100	119,404	120,417	430,472	57,253	116,665	256,554
4	New York	15	70,000	12,178,342	5,239,437	1,210,500	1,653,917	2,375,020	5,938,905	2,385,565	1,838,873	1,714,467
5	Pennsylvania	142	1,205,200	15,129,619	7,466,300	978,539	2,180,776	4,306,985	7,663,319	1,624,680	2,230,986	3,807,653
6	All other states (b)	3	250	2,499,564	785,996	45,000	322,261	418,735	1,713,568	725,698	480,629	507,241

	STATES.	MACHINERY—continued.								
		Spindles.			Total number of power looms.	Looms on carpets and rugs.				
		Woolen.	Worsted.	Cotton.		Total number of looms on carpets and rugs.	Ingrain hand looms.	Ingrain power looms.	Venetian hand looms.	Venetian power looms.
7	The United States	53,046	151,132	4,680	8,538	10,898	631	4,214	157	109
8	Massachusetts	8,078	39,256	1,872	1,150	1,150	.....	311	.....	.....
9	New Jersey	1,820	1,024	.....	207	282	.....	12	.....	.....
10	New York	18,126	78,152	2,808	1,912	2,077	.....	357	.....	.....
11	Pennsylvania	20,242	18,976	.....	4,821	6,936	627	3,235	157	109
12	All other states	4,780	13,724	.....	448	453	4	299	.....	.....

	STATES.	MATERIALS USED.							
		Total cost.	Foreign wool in condition purchased.		Domestic wool in condition purchased.		Total foreign and domestic wool in scoured pounds.	Shoddy.	
			Pounds.	Cost.	Pounds.	Cost.		Pounds.	Cost.
13	The United States	$28,644,905	54,742,234	$9,422,031	2,139,332	$433,756	35,726,837	598,512	$39,295
14	Massachusetts	4,731,873	16,470,121	2,244,474	40,085	7,514	8,579,919	.....	.....
15	New Jersey	430,917	703,927	173,056	.....	.....	547,035	.....	.....
16	New York	8,689,413	17,939,285	3,898,321	1,500,000	300,000	13,687,763	6,735	808
17	Pennsylvania	13,548,371	14,581,759	2,428,166	447,694	92,912	9,902,903	591,777	38,487
18	All other states	1,244,331	5,047,142	678,014	151,553	33,330	3,009,217	.....	.....

	STATES.	MATERIALS USED—continued.							
		Yarns not made in mill—Continued.							
		Worsted.		Cotton.		Mohair.		Jute.	
		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
19	The United States	10,555,799	$4,711,249	17,920,498	$2,712,484	182,400	$23,712	23,670,117	$1,696,280
20	Massachusetts	2,316,087	1,142,740	1,474,455	240,731	.....	.....	2,485,603	202,438
21	New Jersey	38,542	16,018	114,082	20,324	.....	.....	496,337	37,061
22	New York	626,567	259,106	3,742,190	584,101	.....	.....	12,486,875	854,675
23	Pennsylvania	7,488,205	3,233,823	12,035,674	1,781,245	182,400	23,712	7,782,879	557,279
24	All other states	86,398	59,562	554,097	86,083	.....	.....	418,423	44,827

a Includes officers, firm members, and clerks. For detailed information see Table 12.

THAN RAG), BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		MACHINERY.			
										Combing machines.		
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	Cards. (Sets.)	Foreign.	American.	
$1,819,441	$108,997	$168,468	$125,280	$275,555	$349,378	$791,763	29,121	$11,633,116	392	77	41	1
367,164	.....	69,166	26,175	107,752	96,658	67,413	5,144	1,892,072	40	20	23	2
30,502	182	2,889	3,669	18,456	1,447	3,859	585	212,554	22	.....	1	3
399,322	5,400	35,944	29,886	37,498	93,012	197,582	6,954	3,345,165	201	18	16	4
820,434	103,390	38,293	60,802	81,652	156,564	379,733	12,674	5,509,805	104	19	1	5
202,019	25	22,176	4,748	30,197	1,697	143,176	1,764	673,520	25	20	.....	6

MACHINERY—continued.

Looms on carpets and rugs—Continued.								Looms on woolen goods.			
Tapestry brussels power looms.	Body brussels power looms.	Axminster power looms.	Moquette power looms.	Velvet power looms.	Wilton power looms.	Rug hand looms.	Rug power looms.	Broad looms.	Narrow looms.	Hand looms.	
1,498	1,224	95	462	58	62	1,810	578	194	44	99	7
215	539	72	.....	.....	.....	.....	13	.....	.....	.....	8
26	4	.....	.....	40	1	105	94	30	.....	.....	9
943	107	17	400	18	2	219	14	54	.....	.....	10
314	487	6	.....	.....	59	1,485	457	110	44	99	11
.....	87	.....	62	.....	.....	1	.....	.....	.....	.....	12

MATERIALS USED—continued.

Waste and wool noils.		Camel's hair and noils.		Mohair and noils.		All other animal hair.		Raw cotton.		Yarns not made in mill.		
										Woolen.		
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	
960,246	$146,876	1,091,929	$140,175	32,302	$5,456	3,645,096	$373,823	1,725,761	$181,637	18,763,201	$4,112,324	13
24,897	2,654	.....	.....	.....	.....	.....	.....	765,634	76,033	103,933	41,573	14
.....	.....	.....	.....	2,302	456	487,808	42,806	.....	.....	395,000	82,675	15
251,465	48,243	156,457	24,781	.....	.....	529,556	71,966	960,127	105,604	1,212,621	256,794	16
563,884	95,979	486,951	57,779	30,000	5,000	2,542,447	247,354	.....	.....	16,838,127	3,622,736	17
.....	.....	358,521	57,615	.....	.....	85,285	11,697	.....	.....	213,520	108,546	18

MATERIALS USED—continued.

Yarns not made in mill—Continued.		Oil.		Soap.		Chemicals and dyestuffs.	Fuel.			Rent of power and heat.	All other materials.	
Linen.							Total cost.	Coal.	Wood.			
Pounds.	Cost.	Gallons.	Cost.	Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost.	
9,719,242	$1,504,590	546,734	$184,891	3,118,925	$101,496	$978,877	$446,501	$446,251	$250	$18,055	$1,411,394	19
2,100,439	332,389	102,928	29,591	169,280	4,724	159,357	112,067	112,067	.....	.....	135,588	20
39,088	6,437	8,702	3,690	63,578	2,114	18,579	7,417	7,417	.....	.....	20,284	21
4,424,263	640,792	183,755	61,862	926,899	31,008	342,304	140,917	140,667	250	.....	1,068,131	22
2,845,865	475,192	208,738	75,118	1,548,104	54,683	407,701	145,919	145,919	.....	18,055	187,231	23
309,587	49,780	42,611	14,630	411,064	8,970	50,936	40,181	40,181	.....	.....	160	24

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Connecticut, 2; Rhode Island, 1.

TABLE 7.—CARPET MILLS (OTHER

	STATES.	PRODUCTS.							
		Aggregate value.	Total carpets and rugs.	Carpets.					
				Ingrain, 2-ply.		Ingrain 3-ply.		Ingrain, art.	
			Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
1	The United States	$47,770,193	$46,457,083	32,918,659	$13,780,694	3,251,368	$1,816,484	553,513	$325,984
2	Massachusetts	7,275,[illegible]	7,003,956	1,795,300	901,161	308,081	202,286		
3	New Jersey	817,242	579,522	219,069	120,505				
4	New York	14,606,116	14,280,442	2,317,322	1,083,896	519,290	266,263	21,000	11,625
5	Pennsylvania	22,886,416	22,407,753	27,533,220	11,011,721	2,120,486	1,137,742	532,513	314,959
6	All other states	2,185,410	2,185,410	1,053,817	653,411	303,571	210,193		

	STATES.	PRODUCTS—continued.							
		Carpets—Continued.							
		Moquette.		Smyrna.		Rag.		All other.	
		Running yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
7	The United States	3,193,186	$3,247,845	127,177	$332,718	71,310	$23,129	1,312,818	$423,553
8	Massachusetts								
9	New Jersey								
10	New York	2,800,000	2,800,000	15,381	34,186				
11	Pennsylvania	30,000	30,000	111,796	298,532	71,310	23,129	1,312,818	423,553
12	All other states	363,186	417,845						

	STATES.	PRODUCTS—continued.									
		All wool woven goods.						Woolen and worsted upholstery goods.		Felt druggets.	
		Total.		Horse blankets.		Carriage robes.					
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
13	The United States	111,862	$80,300	4,500	$1,250	107,362	$79,050	189,837	$150,565	103,258	$67,118
14	Massachusetts										
15	New Jersey	111,862	80,300	4,500	1,250	107,362	79,050	87,955	90,302	103,258	67,118
16	New York										
17	Pennsylvania							101,882	60,263		
18	All other states										

a Includes items as follows: custom work, $30,000; coverlets, $2,000.

THAN RAG), BY STATES: 1890—Continued.

PRODUCTS—continued.

Carpets—Continued.

Tapestry brussels.		Body brussels.		Tapestry velvet.		Wilton or wilton velvet.		Axminster.		
Running yards.	Value.	Running yards.	Value.	Running yards.	Value.	Running yards.	Value.	Running yards.	Value.	
20,008,961	$11,475,846	9,442,348	$8,107,549	2,482,128	$2,239,166	1,030,101	$1,582,409	379,341	$472,915	1
2,460,400	1,494,000	3,376,883	2,949,816	62,430	89,500	577,333	892,768	349,174	434,723	2
35,948	14,549			194,662	183,977	13,218	12,142			3
14,046,304	8,021,238	845,092	728,956	896,996	795,023	65,735	102,678	30,167	38,192	4
3,466,369	1,943,059	4,397,208	3,648,993	1,328,040	1,170,666	294,475	451,844			5
		823,165	779,784			79,340	122,977			6

PRODUCTS—continued.

Rugs.

Wilton.		Moquette.		Ingrain.		Smyrna.		All other woolen.		
Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	
40,644	$87,702	60,000	$66,000	6,278	$34,262	1,429,536	$2,367,000	26,845	$73,817	7
10,644	39,702									8
						169,985	248,349			9
		60,000	66,000			121,024	287,559	4,651	32,426	10
30,000	48,000			6,278	34,262	1,138,527	1,831,092	21,794	40,191	11
								400	1,200	12

PRODUCTS—continued.

Partly manufactured products for sale.												All other products. (a)	
Total.		Woolen yarn, all wool.		Woolen yarn, union or merino.		Worsted yarn.		Worsted noils.		Waste.			
Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.	
2,616,410	$953,127	443,573	$104,336	57,637	$12,025	1,922,135	$799,748	84,000	$16,000	109,065	$21,018	$62,000	13
704,728	271,053			57,637	12,025	538,091	238,028	84,000	16,000	25,000	5,000		14
													15
1,023,682	325,674	421,573	94,336			534,044	221,720			68,065	9,618		16
888,000	356,400	22,000	10,000			850,000	340,000			16,000	6,400	62,000	17
													18

TABLE 8.—FELT MILLS,

	STATES.	Number of establishments.	CAPITAL.								
				Direct investment.							
			Value of hired property.	Aggregate.	Value of plant.				Live assets.			
					Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	34	$128,400	$4,460,621	$1,865,984	$276,780	$714,453	$874,751	$2,594,637	$835,694	$824,370	$934,573
2	Massachusetts	7	9,000	731,976	303,073	62,660	142,625	97,788	428,903	79,025	71,284	278,594
3	New York	11	85,000	1,371,219	561,187	89,500	236,386	235,301	810,032	303,646	256,038	250,348
4	Ohio	4	1,600	520,298	248,432	25,320	71,642	151,470	271,866	38,000	105,382	128,484
5	Pennsylvania	3	7,800	242,207	120,500	5,500	41,000	74,000	121,707	28,050	62,229	31,428
6	All other states (b)	9	25,000	1,594,921	632,792	93,800	222,800	316,192	962,129	386,973	329,437	245,719

	STATES.	MATERIALS USED.											
		Total cost.	Foreign wool in condition purchased.		Domestic wool in condition purchased.		Total foreign and domestic wool in scoured pounds.	Shoddy.		Waste and wool noils.		Camel's hair and noils.	
			Pounds.	Cost.	Pounds.	Cost.		Pounds.	Cost.	Pounds.	Cost.	Pounds	Cost.
7	The United States	$2,809,937	1,689,588	$448,350	5,039,495	$1,393,032	4,213,230	1,450,384	$179,505	1,344,619	$262,887	68,250	$3,071
8	Massachusetts	637,928	121,335	39,006	1,091,953	260,326	564,604	765,482	87,914	496,170	110,423	68,250	3,071
9	New York	807,276	716,229	235,253	1,128,919	365,124	1,452,092	375,947	57,350	245,578	44,802	.....	.....
10	Ohio	209,497	.....	.....	559,844	192,112	393,744	.....	.....	.....	.....	.....	.....
11	Pennsylvania	138,736	97,000	15,520	115,000	60,000	147,750	.....	.....	.....	.....	.....	.....
12	All other states	1,016,500	755,024	158,571	2,143,779	515,470	1,655,040	308,955	34,241	602,871	107,662	.....	.....

	STATES.	PRODUCTS.								
		Aggregate value.	Felt goods.							
			Total.		Cloths.		Trimmings and linings.		Table and piano covers.	
			Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
13	The United States	$4,654,768	6,808,115	$3,028,836	2,607,537	$979,364	1,176,114	$90,738	20,000	$57,400
14	Massachusetts	918,890	3,587,529	836,890	1,351,010	239,314	395,114	79,023	.....	.....
15	New York	1,517,199	320,480	824,712	293,980	293,980	.....	.....	.....	.....
16	Ohio	406,700	81,800	365,900	.....	.....	.....	.....	.....	.....
17	Pennsylvania	322,800	374,499	123,000	.....	.....	.....	.....	.....	.....
18	All other states	1,489,179	2,443,807	878,334	962,547	446,070	781,000	11,715	20,000	57,400

	STATES.	PRODUCTS—continued.							
		Felt goods—Continued.		All wool woven goods.					
		Hair felting.		Total.		Cloths, doeskins, cassimeres, cheviots, indigo flannels, and broadcloths for men's wear.		Flannels.	
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.
19	The United States	551,760	$188,341	579,337	$497,307	370,148	$360,177	16,145	$10,800
20	Massachusetts	177,261	65,341	.....	.....	.....	.....	.....	.....
21	New York	.....	.....	155,376	105,330	.....	.....	.....	.....
22	Ohio	.....	.....	53,813	31,800	.....	.....	16,145	10,800
23	Pennsylvania	374,499	123,000	.....	.....	.....	.....	.....	.....
24	All other states	.....	.....	370,148	360,177	370,148	360,177	.....	.....

a Includes officers, firm members, and clerks. For detailed information, see Table 12.

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Connecticut, 2; Indiana, 1; Maine, 1; Michigan, 1; New Hampshire, 2; New Jersey, 2.

BY STATES: 1890.

MISCELLANEOUS EXPENSES.						AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		MACHINERY.			
									Spindles.	Looms.	
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	Cards. (Sets.)	Woolen.	Broad looms on woolen goods.	Narrow looms on woolen goods.	
$272,871	$12,648	$16,000	$29,825	$49,686	$51,758	$72,954	2,266	$1,041,296	198	13,829	200	10	
29,386	768	5,883	4,278	5,820	3,293	9,344	340	140,528	52	.....	.....	.....	1
86,273	8,860	2,496	11,012	9,000	32,148	22,757	820	361,944	63	4,623	53	2	2
28,191	90	2,972	2,444	1,200	6,577	14,908	183	92,161	8	2,826	43	2	3
10,780	780	185	2,560	1,050	2,400	3,805	176	111,682	6	.....	.....	.....	4
78,241	2,150	4,464	9,531	32,616	7,340	22,140	747	334,981	69	6,380	104	6	5
													6

MATERIALS USED—continued.

All other animal hair.		Raw cotton.		Cotton yarn.		Oil.		Soap.		Chemicals and dyestuffs.	Fuel.			Rent of power and heat.	All other materials.	
											Total cost.	Coal.	Wood.			
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Gallons.	Cost.	Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost	
2,355,928	$48,301	395,032	$37,133	10,241	$2,019	41,240	$14,704	834,205	$32,718	$122,100	$92,551	$90,553	$1,998	$750	$172,816	7
1,722,028	17,659	110,800	9,892	1,500	315	3,876	1,638	168,742	5,984	31,309	21,668	21,470	198	.....	48,723	8
600	962	29,700	2,673	6,405	1,153	9,989	4,265	187,788	8,062	13,249	31,904	31,904	.....	.....	42,479	9
300	30	.....	.....	.....	.....	6,700	2,004	100,000	2,817	4,194	4,820	4,820	.....	.....	3,520	10
633,000	29,650	.....	.....	.....	.....	10,000	3,000	65,000	2,600	5,800	5,166	5,166	.....	.....	17,000	11
.....	.....	254,532	24,568	2,336	551	10,675	3,797	312,675	13,255	67,548	28,993	27,193	1,800	750	61,094	12

PRODUCTS—continued.

Felt goods—Continued.

For ladies' hats.		Saddle felts.		Rubber shoe linings.		Endless belts.		Druggets.		
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
36,000	$18,000	45,904	$22,952	2,087,557	$576,946	201,163	$1,070,471	82,080	$24,624	13
36,000	18,000	.....	.....	1,628,144	435,212	.....	.....	.....	.....	14
.....	.....	.....	.....	.....	.....	26,500	530,732	.....	.....	15
.....	.....	1,800	900	.....	.....	80,000	365,000	.....	.....	16
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17
.....	.....	44,104	22,052	459,413	141,734	94,663	174,739	82,080	24,624	18

PRODUCTS—continued.

All wool woven goods—Continued.				Goods woven on cotton warps, weft partly or wholly of wool or hair.		Partly manufactured products for sale.		All other products. (c)	
Blankets.		Horse blankets.				Woolen yarn.			
Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Pounds.	Value.	Value.	
37,668	$21,000	155,376	$105,330	41,961	$25,394	10,000	$9,000	$1,094,231	19
.....	.....	.....	.....	.....	.....	.....	.....	82,000	20
.....	.....	155,376	105,330	15,339	10,226	.....	.....	576,931	21
37,668	21,000	.....	.....	.....	.....	10,000	9,000	.....	22
.....	.....	.....	.....	.....	.....	.....	.....	199,800	23
.....	.....	.....	.....	26,622	15,168	.....	.....	235,500	24

c Includes items as follows: felt boots, $427,433; felt shoes, $366,087; piano felts, $22,000; piano goods, $151,443; piano hammers, $44,227; polishing felt, $83,041.

TABLE 9.—WOOL HAT

	STATES.	Number of establishments.	CAPITAL.								
				Direct investment.							
			Value of hired property.	Value of plant.				Live assets.			
				Aggregate.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	32	$226,960	$4,142,224	$1,194,389	$144,350	$381,105	$668,934	$2,947,835	$900,459	$1,029,917	$1,017,459
2	Massachusetts	7	50,000	1,043,500	324,439	21,000	104,705	198,734	719,151	211,802	336,742	170,807
3	New York	5	50,000	1,444,767	520,000	67,000	158,000	295,000	924,767	282,323	215,061	427,383
4	Pennsylvania	17	57,500	1,048,804	261,450	41,350	73,400	146,700	787,354	303,989	324,817	158,568
5	All other states (b)	3	69,460	605,063	88,500	15,000	45,000	28,500	516,563	102,565	153,297	260,701

	STATES.	MATERIALS USED.							
		Total cost.	Foreign wool in condition purchased.		Domestic wool in condition purchased.		Total foreign and domestic wool in scoured pounds.	Shoddy.	
			Pounds.	Cost.	Pounds.	Cost.		Pounds.	Cost.
6	The United States	$2,802,041	259,325	$75,615	4,278,628	$1,373,184	3,018,114	306,351	$85,963
7	Massachusetts	829,263	35,662	21,989	887,734	289,513	590,045	172,433	50,518
8	New York	860,937	103,953	23,278	1,594,551	447,722	1,064,516	28,203	7,750
9	Pennsylvania	747,700	119,710	30,348	868,980	411,187	868,690	89,487	24,064
10	All other states	364,141			927,363	224,762	494,863	16,228	3,631

	STATES.	MATERIALS USED—continued.							
		Oil.		Soap.		Chemicals and dyestuffs.	Fuel—coal.	Rent of power and heat.	All other materials.
		Gallons.	Cost.	Pounds.	Cost.	Cost.	Cost.	Cost.	Cost.
11	The United States	22,817	$7,102	631,476	$23,857	$128,741	$84,904	$2,250	$707,663
12	Massachusetts	3,710	1,074	157,100	5,773	39,062	23,674	2,250	239,065
13	New York	5,040	1,725	139,258	7,250	31,831	22,543	.....	287,502
14	Pennsylvania	3,243	847	249,764	7,918	45,776	26,604	.....	75,875
15	All other states	10,824	3,456	85,354	2,916	12,072	12,083	.....	105,221

a Includes offices, firm members, and clerks. For detailed information see Table 12.

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Connecticut, 2; Maine 1.

MILLS, BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		MACHINERY.	
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	Cards. (Sets.)	
$249.568	$19,070	$13,432	$26,703	$36,033	$79,134	$75,196	3,592	$1,363,944	229	1
79.247	3,350	4,576	9,212	14,418	17,451	30,240	1,045	482,602	50	2
54.233	5,500	3,558	7,606	4,999	20,180	12,300	997	361,512	71	3
58.490	4,210	2,211	6,748	11,693	20,494	13,134	1,049	330,050	72	4
57.598	6,010	3,087	3,047	4,923	21,009	19,522	501	189,780	36	5

MATERIALS USED—continued.

Waste and wool noils.		Camel's hair and noils.		Mohair and noils.		All other animal hair.		Yarns not made in mill.		
								Woolen.		
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	
662,092	$166,162	11,688	$5,610	4,508	$2,130	147,600	$113,878	350,000	$24,982	6
29.810	15,355	.....	.....	4,508	2,130	147,600	113,878	350,000	24,982	7
79.921	31,336	.....	.....	.....	.....	.....	.....	.....	.....	8
552,361	119,471	11,688	5,610	.....	.....	.....	.....	.....	.....	9
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10

PRODUCTS.

Aggregate value.	Hats.						Partly manufactured products for sale.		All other products. (c)	
	Total.		Wool hats.		All other hats.		Waste.			
	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Pounds.	Value.	Value.	
$5,329,921	1,046,381	$5,228,876	972,375	$4,611,851	74,006	$617,025	9,500	$1,045	100,000	11
1,700,486	257,867	1,700,486	186,180	1,088,226	71,687	612,260	.....	.....	.....	12
1,489,132	275,847	1,489,132	275,847	1,489,132	.....	.....	.....	.....	.....	13
1,444,180	386,738	1,443,135	384,419	1,438,370	2,319	4,765	9,500	1,045	.....	14
696,123	125,929	596,123	125,929	596,123	.....	.....	.....	.....	100,000	15

c Scotch caps, 25,000 dozen, $100,000.

TABLE 9.—WOOL HAT

	STATES.	Number of establishments.	CAPITAL.								
			Value of hired property.	Direct investment.							
				Aggregate.	Value of plant.				Live assets.		
					Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	32	$226,960	$4,142,224	$1,194,389	$144,350	$381,105	$668,934	$2,947,835	$900,459	$1,029,917	$1,017,459
2	Massachusetts	7	50,000	1,043,590	324,439	21,000	104,705	198,734	719,151	211,602	336,742	170,807
3	New York	5	50,000	1,444,767	520,000	67,000	158,000	295,000	924,767	282,323	215,061	427,383
4	Pennsylvania	17	57,500	1,048,804	281,450	41,350	73,400	146,700	767,354	303,989	324,817	158,568
5	All other states (b)	3	69,460	605,063	88,500	15,000	45,000	28,500	516,563	102,565	153,297	260,701

	STATES.	MATERIALS USED.							
		Total cost.	Foreign wool in condition purchased.		Domestic wool in condition purchased.		Total foreign and domestic wool in scoured pounds.	Shoddy.	
			Pounds.	Cost.	Pounds.	Cost.		Pounds.	Cost.
6	The United States	$2,802,041	259,325	$75,615	4,278,628	$1,373,184	3,018,114	306,351	$85,963
7	Massachusetts	829,263	35,662	21,989	887,734	289,513	590,045	172,433	50,518
8	New York	860,937	103,953	23,278	1,594,551	447,722	1,064,516	28,203	7,750
9	Pennsylvania	747,700	119,710	30,348	868,980	411,187	868,690	89,487	24,064
10	All other states	364,141			927,363	224,762	494,863	16,228	3,631

	STATES.	MATERIALS USED—continued.							
		Oil.		Soap.		Chemicals and dyestuffs.	Fuel—coal.	Rent of power and heat.	All other materials.
		Gallons.	Cost.	Pounds.	Cost.	Cost.	Cost.	Cost.	Cost.
11	The United States	22,817	$7,102	631,476	$23,857	$128,741	$84,904	$2,250	$707,663
12	Massachusetts	3,710	1,074	157,100	5,773	39,062	23,674	2,250	239,065
13	New York	5,040	1,725	139,258	7,250	31,831	22,543	.....	287,502
14	Pennsylvania	3,243	847	249,764	7,918	45,776	26,604	.....	75,875
15	All other states	10,824	3,456	85,354	2,916	12,072	12,083	.....	105,221

a Includes offices, firm members, and clerks. For detailed information see Table 12.

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Connecticut, 2; Maine, 1.

MILLS, BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		MACHINERY.	
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	Cards. (Sets.)	
$249,568	$19,070	$13,432	$26,703	$36,033	$79,134	$75,196	3,592	$1,363,944	229	1
79,247	3,350	4,576	9,212	14,418	17,451	30,240	1,045	482,602	50	2
54,233	5,500	3,558	7,606	4,999	20,180	12,300	997	361,512	71	3
58,490	4,210	2,211	6,748	11,693	20,494	13,134	1,049	330,050	72	4
57,598	6,010	3,087	3,047	4,923	21,009	19,522	501	189,780	36	5

MATERIALS USED—continued.

Waste and wool noils.		Camel's hair and noils.		Mohair and noils.		All other animal hair.		Yarns not made in mill.		
								Woolen.		
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	
662,092	$166,162	11,688	$5,610	4,508	$2,130	147,600	$113,878	350,000	$24,982	6
29,810	15,355			4,508	2,130	147,600	113,878	350,000	24,982	7
79,921	31,336									8
552,361	119,471	11,688	5,610							9
										10

PRODUCTS.

Aggregate value.	Hats.						Partly manufactured products for sale.		All other products. (c)	
	Total.		Wool hats.		All other hats.		Waste.			
	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Pounds.	Value.	Value.	
$5,329,921	1,046,381	$5,228,876	972,375	$4,611,851	74,006	$617,025	9,500	$1,045	100,000	11
1,700,486	257,867	1,700,486	186,180	1,088,226	71,687	612,260				12
1,489,132	275,847	1,489,132	275,847	1,489,132						13
1,444,180	386,738	1,443,135	384,419	1,438,370	2,319	4,765	9,500	1,045		14
696,123	125,929	596,123	125,929	596,123					100,000	15

c Scotch caps, 25,000 dozen, $100,000.

TABLE 10.—HOSIERY AND KNITTING MILLS,

MATERIALS USED—continued.

	STATES AND TERRITORIES.	Yarns not made in mill.									
		Woolen.		Worsted.		Cotton.		Mohair.		Silk.	
		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
1	The United States	6,386,370	$3,791,497	4,146,035	$4,279,105	32,248,849	$7,588,973	125	$98	77,597	$418,075
2	Alabama					545,400	95,742				
3	Connecticut	177,100	115,650	177,331	203,943	467,410	129,986			369	1,713
4	Georgia					286,340	57,269				
5	Illinois	251,020	156,655	72,480	54,340	1,223,500	439,201			6,472	36,385
6	Indiana	74,098	31,736	3,342	3,127	231,413	44,167				
7	Iowa	1,275	1,100			3,000	600				
8	Louisiana					120,000	24,000				
9	Maine	29,075	20,494	12,320	10,883	6,000	1,740			25	225
10	Maryland	54,750	34,130	14,000	14,600	115,700	32,175				
11	Massachusetts	456,440	254,273	278,853	314,481	1,828,589	449,367			13,503	67,676
12	Michigan	121,667	75,989	19,400	16,225	67,400	14,800			6,140	36,925
13	Minnesota	64,000	28,000	41,000	34,400	42,000	8,562			2,160	9,016
14	Missouri	30,325	20,250			37,500	9,500				
15	New Hampshire	96,658	71,051	106,478	122,660	113,609	34,670			3,155	14,235
16	New Jersey	113,600	102,435	36,629	39,922	462,582	100,623				
17	New York	1,034,837	693,938	695,260	745,865	5,635,241	1,261,117			10,223	67,169
18	North Carolina					277,000	62,200				
19	Ohio	851,313	508,349	145,857	153,507	296,392	63,730			2,036	10,380
20	Pennsylvania	1,985,017	1,190,683	1,995,905	2,021,023	17,511,141	4,080,238	125	98	29,654	158,881
21	Rhode Island	108,159	56,769	445,633	441,038	2,289,364	518,536			2,000	5,000
22	Utah	31,375	20,988	2,500	3,287	500	125			25	250
23	Vermont	2,000	1,500			233,588	65,129			1,000	4,600
24	Wisconsin	886,786	394,829	84,047	81,804	249,545	52,516			715	4,600
25	All other states	16,875	12,678	15,000	18,000	205,635	42,980			120	1,020

PRODUCTS.

	STATES AND TERRITORIES.	Aggregate value.	Hosiery and knit goods.							
			Total value.	Woolen half hose.		Woolen hose.		Merino or mixed half hose.		Merino or mixed hose.	
				Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.
26	The United States	$67,241,013	$63,318,727	1,360,824	$2,892,822	2,242,544	$4,722,796	376,053	$604,773	433,083	$791,227
27	Alabama	190,725	190,725								
28	Connecticut	3,771,567	3,663,661	83,074	179,746	847	5,480	2,308	4,520		
29	Georgia	166,850	166,850								
30	Illinois	1,990,035	1,912,026	128,569	270,295	129,940	304,363	12,007	24,014	10,609	23,140
31	Indiana	827,104	662,139	96,365	208,722	98,243	198,723	1,748	3,058	10,564	16,799
32	Iowa	5,763	4,938	7	42	20	180				
33	Louisiana	151,180	139,660								
34	Maine	76,603	76,603	1,500	3,700	170	1,000			100	200
35	Maryland	180,823	180,823	40,400	61,300	5,500	16,800				
36	Massachusetts	5,082,087	4,717,024	46,610	135,200	167,898	349,118	4,610	12,000	26,922	154,591
37	Michigan	701,322	595,142	24,290	74,270	20,447	107,720	15,020	36,230	7,000	26,200
38	Minnesota	183,743	181,928	16,300	57,200	1,000	3,167				
39	Missouri	81,445	81,445	1,000	1,525	14,100	24,750			30,000	45,000
40	New Hampshire	3,481,922	3,413,618	223,570	418,863	1,015,337	2,081,895	106,843	177,823	31,066	51,748
41	New Jersey	1,091,403	1,077,452	10	40	27,540	37,685	16,653	37,475	5	21
42	New York	24,776,582	23,494,419	99,775	232,100	40,700	90,250	7,500	9,375	45,000	40,000
43	North Carolina	126,875	126,625								
44	Ohio	1,645,948	1,611,558	200,486	352,389	271,610	499,766	44,167	78,333	27,500	32,600
45	Pennsylvania	16,944,237	15,736,675	152,926	270,774	194,152	297,564	133,597	162,945	187,517	289,723
46	Rhode Island	2,516,664	2,276,970	29,500	78,625	151,900	443,573	300	300	50,000	100,000
47	Utah	53,560	47,960	6,198	24,500	8,350	22,000				
48	Vermont	1,105,958	1,105,958	12,520	46,396						
49	Wisconsin	1,635,641	1,478,752	183,174	450,435	80,680	204,080	31,100	56,700	650	1,705
50	All other states	462,976	375,776	14,550	26,700	14,110	34,682	200	2,000	6,150	9,530

BY STATES AND TERRITORIES: 1890—Continued.

MATERIALS USED—continued.

Yarns not made in mill—Continued.				Oil.		Soap.		Chemicals and dyestuffs.	Fuel.			Rent of power and heat.	All other materials.	
Spun silk.		Linen.							Total cost.	Coal.	Wood.			
Pounds.	Cost.	Pounds.	Cost.	Gallons.	Cost.	Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost.	
42,744	$182,249	301,695	$65,335	528,504	$135,037	6,647,236	$212,844	$564,053	$509,086	$489,968	$19,118	$87,579	$3,017,436	1
.....	.....	.....	.....	1,200	300	.....	.....	.....	2,043	2,043	.....	.....	5,808	2
[illegible]	35,867	.....	.....	53,658	9,146	424,209	15,733	26,579	43,496	41,740	1,756	905	239,006	3
.....	.....	.....	.....	243	89	1,500	50	150	1,139	1,133	6	.....	.....	4
2,200	10,200	4,000	8,000	7,892	2,287	150,560	4,657	9,378	9,202	9,202	.....	3,460	23,010	5
.....	.....	.....	.....	9,042	2,704	526,917	3,971	10,297	6,229	6,229	.....	930	27,176	6
.....	.....	.....	.....	.....	.....	.....	.....	10	40	40	.....	.....	225	7
.....	.....	.....	.....	600	100	.....	.....	500	2,352	2,352	.....	450	800	8
.....	.....	.....	.....	10	3	300	8	100	106	6	100	80	200	9
.....	.....	.....	.....	350	35	10,500	525	3,000	1,398	1,398	.....	.....	1,452	10
1,281	11,265	550	560	18,643	4,156	236,397	8,443	78,531	58,709	58,359	350	5,804	330,620	11
500	1,300	.....	.....	3,060	1,197	99,350	3,144	5,187	3,905	3,845	60	850	8,213	12
.....	.....	.....	.....	450	105	10,200	309	226	912	900	12	500	5,632	13
.....	.....	.....	.....	.....	.....	.....	.....	.....	20	20	.....	684	70	14
.....	.....	.....	.....	77,976	14,929	460,240	12,654	63,096	38,679	24,161	14,518	6,153	96,267	15
225	1,200	.....	.....	8,058	3,855	149,410	5,934	14,142	13,688	13,688	.....	660	62,823	16
14,012	50,734	5,600	2,040	259,273	72,355	3,615,139	118,007	161,060	191,867	191,656	211	32,853	1,513,151	17
.....	.....	.....	.....	459	150	6,000	150	300	875	475	400	100	3,150	18
894	4,090	3,000	820	4,400	1,315	65,800	1,572	7,279	5,669	5,669	.....	1,776	23,598	19
9,343	37,593	288,545	53,915	50,298	10,898	466,229	24,936	128,897	77,376	77,376	.....	20,496	516,989	20
5,225	20,970	.....	.....	13,907	5,369	150,405	5,832	33,627	23,513	23,513	.....	2,472	14,864	21
.....	.....	.....	.....	300	75	750	25	200	375	375	.....	.....	150	22
14	58	.....	.....	11,206	3,600	93,923	2,496	6,832	9,207	9,117	90	1,931	72,690	23
484	2,193	.....	.....	6,029	1,974	100,407	2,478	13,842	14,461	13,311	1,150	6,721	37,899	24
1,500	6,750	.....	.....	1,450	395	79,000	1,920	820	3,825	3,360	465	748	24,643	25

PRODUCTS—continued.

Hosiery and knit goods—Continued.

Cotton half hose.		Cotton hose.		Merino or mixed shirts and drawers.		All woolen shirts and drawers.		All cotton shirts and drawers.		Leggings and gaiters.		
Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	
7,141,628	$3,936,536	7,387,259	$6,214,052	2,526,226	$15,055,999	1,088,841	$8,881,777	3,246,590	$9,024,221	25,072	$85,401	26
100,000	65,000	134,000	91,600	.....	.....	.....	.....	10,000	34,125	.....	.....	27
26,000	48,000	.....	.....	187,841	1,619,133	68,177	913,416	159,060	424,118	2,000	5,000	28
68,249	47,474	97,900	93,126	.....	.....	.....	.....	15,000	26,250	.....	.....	29
1,044,054	740,401	27,437	34,373	7,882	97,900	885	17,314	100,000	80,000	1,100	5,400	30
105,176	65,078	23,305	24,636	2,400	24,000	2,500	37,500	.....	.....	423	2,638	31
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	180	32
46,400	35,300	105,000	95,000	.....	.....	.....	.....	9,360	9,360	.....	.....	33
2,700	3,375	.....	.....	.....	.....	.....	.....	.....	.....	112	644	34
71,085	50,851	3,115	4,704	.....	.....	766	7,660	8,333	33,332	200	800	35
142,907	255,365	685,134	513,788	30,754	216,980	67,610	558,394	434,380	1,282,337	1,725	8,900	36
76,000	59,000	12,000	25,000	19,874	90,915	1,700	62,600	350	10,500	100	375	37
1,000	1,344	1,000	2,667	5,000	100,000	500	10,000	.....	.....	.....	.....	38
4,500	3,300	1,200	1,070	.....	.....	.....	.....	.....	.....	.....	.....	39
.....	.....	169,000	135,200	57,700	367,550	14,538	143,273	.....	.....	.....	.....	40
35,500	21,269	272,755	237,009	44,393	505,916	3,808	51,652	4,611	40,900	.....	.....	41
58,104	104,177	41,732	34,675	1,888,361	10,158,826	778,011	5,924,735	1,714,825	5,179,811	15,941	49,798	42
48,875	52,075	12,000	13,050	.....	.....	.....	.....	21,750	61,500	.....	.....	43
87,960	66,454	40,150	41,163	11,140	97,950	21,400	194,000	12,600	23,500	450	900	44
3,400,556	2,291,148	5,658,384	4,710,753	147,869	1,051,089	39,941	244,897	655,021	1,502,738	1,942	5,867	45
7,500	9,100	89,040	140,600	19,000	107,000	12,400	130,000	80,000	208,000	954	4,524	46
200	200	100	200	.....	.....	10	225	.....	.....	10	40	47
.....	.....	.....	.....	47,802	384,500	68,645	477,750	18,000	102,000	.....	.....	48
5,740	5,700	9,107	11,763	6,700	58,000	5,950	82,361	3,000	5,000	45	135	49
17,150	11,925	4,000	3,675	49,510	176,240	2,000	26,000	300	750	50	200	50

TABLE 10.—HOSIERY AND KNITTING MILLS.

	STATES AND TERRITORIES.	PRODUCTS—continued.									
		Hosiery and knit goods—Continued.									
		Gloves and mittens.		Hoods, scarfs, nubias, etc.		Cardigan jackets, fancy jackets, etc.		Shawls.		Fancy knit goods, wristers, etc.	
		Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.	Dozens.	Value.
1	The United States	896,150	$1,935,080	342,497	$1,476,430	361,478	$3,576,248	22,990	$115,467	270,535	$759,648
2	Alabama										
3	Connecticut	16,700	23,200			17,800	190,800				
4	Georgia										
5	Illinois	66,540	170,335	12,950	55,491	6,771	57,540	104	260	5,550	31,200
6	Indiana	50,000	74,000	1,600	3,000						
7	Iowa	6	36	300	1,000					1,200	3,500
8	Louisiana										
9	Maine	28,100	58,600	137	2,244	130	2,160	12	180	1,350	4,500
10	Maryland					204	4,076			630	1,300
11	Massachusetts	166,822	328,695	6,660	27,006	49,990	279,762	100	1,800	400	605
12	Michigan	27,840	87,120	1,500	4,500	600	7,200			1,215	3,512
13	Minnesota	2,200	7,200	150	300					25	50
14	Missouri	1,000	3,900			110	1,400			200	500
15	New Hampshire	29,030	35,266							1,000	2,000
16	New Jersey			3,000	18,000	6,702	45,485	50	2,000		
17	New York	92,426	216,360	48,898	210,891	74,473	945,369	4,445	25,200	110,590	263,652
18	North Carolina										
19	Ohio	90,795	167,378	12,476	41,325	200	5,000			13,285	10,800
20	Pennsylvania	78,562	206,780	233,160	1,014,960	128,230	1,943,607	18,209	85,077	75,263	408,567
21	Rhode Island	30,060	52,500	1,800	14,000	1,000	7,500				
22	Utah	125	275			15	500			10	20
23	Vermont	3,200	7,290							53,000	13,022
24	Wisconsin	212,054	493,695	19,836	83,533	679	9,675	50	650	2,715	11,420
25	All other states	750	2,450	30	180	74,574	76,174	20	300	4,100	5,000

a Includes items as follows: abdominal bands, $800; athletic goods, $61,400; bandages, $833; bathing suits and athletic goods, $26,400, blankets, $14,240; braid, $243,000; card rolls, $159; cotton batting, $243; cotton waste, $794; cotton yarn, $69,287; cloaking, $245,000; curtains $180,000; custom work, $825; dyeing cotton yarn, $1,200; eider down, $122,000; elastic hosiery, $13,797; flannels, $150; fleece lining, $22,663; fringes, $15,000; German socks, $83,100; glace lining, $50,000; Guernsey frocks, $150; horse blankets, $1,006; infants' bands, $11,654; infants' shirts, $1,500; jeans, $6,300; knit boots, $43,000; lace, $150; ladies' caps, $623; ladies' silk vests, $18,000; ladies' skirts and bathing suits, $5,600; overshirts, $11,690; pants, overalls, and shirts, $20,000; paper boxes, $6,240; Persian knit slippers, $846; rag carpets,

BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.													
Hosiery and knit goods—Continued.				Partly manufactured products for sale.								All other products. (a)	
Boot and shoe linings.		Jersey cloth.		Total.		Woolen yarn.		Worsted yarn.		Cotton yarn.			
Yards.	Value.	Yards.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.	
7,326,711	$1,088,558	3,065,057	$2,157,692	1,369,180	$636,345	852,180	$472,703	17,000	$13,642	500,000	$150,000	$3,285,941	1
													2
695,011	247,038	5,136	3,210	13,000	9,692			13,000	9,692			98,214	3
													4
				104,500	63,500	104,500	63,500					14,509	5
		4,000	3,985	69,327	31,775	69,327	31,775					133,190	6
												825	7
												11,520	8
													9
													10
1,101,900	290,600	438,735	301,883	112,000	74,000	112,000	74,000					291,063	11
												106,180	12
												1,815	13
													14
				41,965	29,047	41,965	29,047					39,257	15
		80,000	80,000	1,627	786	1,627	786					13,165	16
		28,600	9,200	58,000	32,300	58,000	32,300					1,249,863	17
												250	18
				2,500	1,500	2,500	1,500					22,890	19
		1,394,106	1,250,186	404,261	212,745	400,261	208,795	4,000	3,950			994,817	20
548,620		514,000	432,628	500,000	150,000					500,000	150,000	89,694	21
												5,600	22
		600,000	75,000										23
1,800	2,300	480	1,600	46,000	21,000	46,000	21,000					135,889	24
				16,000	10,000	16,000	10,000					77,200	25

$1,679; repairing, $100; Scotch caps, $741,163; shirts, $2,400; shirts and bicycle pants, $300; silk, $85,000; silk hose, $18,280; silk mittens, $29,150; silk nail cloths, $9,000; silk shirts, $100; silk towels, $50; silk underwear, $91,750; silk vests, $30,000; silk and worsted goods, $70,939; skirts, $15,640; sporting goods, $10,000; spun silk hose, $1,400; surgical elastic goods, $3,500; surgical hosiery, $33,950; sweaters, $15,800; theatrical goods, $12,000; theatrical tights, $62,084; tubing, $1,489; waste, $28,486; white cotton shirts from cloth supplied, $60,000; Wilton fringes, $1,050; wool boots and shoes, $113,190; wool boot material, $36,180; worsted hose, $42,900; worsted shirts, $9,000; miscellaneous, $470,271.

TABLE 11.—CLASSIFICATION OF EMPLOYÉS AND WAGES IN ALL CLASSES

	STATES AND TERRITORIES.	Number of establishments.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. (a)									
			Aggregates.		Officers or firm members actively engaged in the industry or in supervision.							
					Males above 16 years.				Females above 15 years.			
			Average number.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.
1	The United States	2,489	219,132	$76,660,742	3,117	43	$29.21	$3,902,747	46	38	$12.52	$21,658
2	Alabama	9	428	67,963	5	38	14.44	2,753				
3	Arkansas	6	31	6,231	9	28	11.80	2,950				
4	California	10	1,375	328,824	24	46	23.84	26,120				
5	Connecticut	98	13,047	4,940,783	155	47	37.41	272,752	1	50	10.00	500
6	Delaware	3	297	103,395	5	47	41.43	9,668				
7	Georgia	18	528	104,353	19	29	23.82	12,950				
8	Illinois	58	2,792	858,889	78	43	25.53	85,807	2	50	13.50	1,350
9	Indiana	55	3,109	817,387	91	40	25.05	90,086	2	33	18.75	1,250
10	Iowa	17	387	135,790	17	36	17.52	10,765				
11	Kentucky	44	2,042	615,055	62	34	30.29	63,536				
12	Louisiana	4	286	52,517	7	48	28.19	9,514				
13	Maine	82	5,453	1,991,676	89	40	31.25	111,024	4	28	12.53	1,410
14	Maryland	17	689	185,397	19	46	19.03	16,650				
15	Massachusetts	293	43,038	16,154,034	372	47	38.73	671,394	1	42	12.00	500
16	Michigan	43	1,428	390,147	48	38	19.83	36,631	2	44	10.00	875
17	Minnesota	24	470	167,323	26	34	27.20	23,855				
18	Mississippi	7	1,082	306,270	11	31	29.42	9,130				
19	Missouri	42	635	156,887	40	28	18.24	20,591				
20	New Hampshire	89	9,400	3,341,695	115	46	29.32	154,333	1	46	21.82	1,000
21	New Jersey	50	7,248	2,416,371	73	46	33.61	112,430	1	25	6.24	156
22	New York	339	37,992	13,033,901	456	43	32.43	641,502	12	44	12.47	6,652
23	North Carolina	32	508	95,739	24	30	12.13	8,861				
24	Ohio	113	3,329	915,656	130	41	22.68	120,560	3	43	16.03	2,070
25	Oregon	6	402	175,313	19	36	26.48	17,875				
26	Pennsylvania	703	55,354	19,764,386	838	44	24.49	910,886	13	36	11.07	5,245
27	Rhode Island	85	19,325	7,049,109	124	48	39.35	234,652				
28	Tennessee	49	998	239,657	51	32	22.07	35,705	2	3	14.40	90
29	Texas	4	359	138,795	3	29	15.03	1,315				
30	Utah	14	344	121,176	16	33	26.50	14,025				
31	Vermont	39	2,303	895,284	46	41	25.35	48,375				
32	Virginia	37	612	166,798	32	37	15.73	18,595				
33	West Virginia	32	307	67,380	30	31	12.34	11,642				
34	Wisconsin	56	3,383	810,463	75	43	28.21	90,280	2	29	9.60	560
35	All other states (b)	11	151	46,098	8	39	15.36	4,735				

a The average weekly earnings per employé are computed from individual reports. The average number of employés reported by each establishment is multiplied by the number of weeks embraced by the term of operation; the result is the number of weeks required for one employé to perform the labor. Aggregating such results of individual reports, the number of weeks required for one employé to perform the labor is obtained. This number used as a divisor for the total wages produces the true average weekly earnings.

OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

	Clerks.							Operatives and skilled.							
	Males above 16 years.			Females above 15 years.				Males above 16 years.				Females above 15 years.			
	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	
	1,983	47	$19.34	$1,749,820	177	46	$8.34	$68,623	80,194	47	$9.02	$34,191,923	69,706	47	$5.94	$19,637,084	1
	1	50	6.00	300	.....	.....	.....	.....	29	45	7.67	10,036	133	50	4.30	28,596	2
	.....	.....	.....	.....	.....	.....	.....	.....	7	33	6.04	1,385	12	31	4.69	1,740	3
	20	34	27.19	18,470	.....	.....	.....	.....	853	25	8.74	189,377	363	25	7.23	65,819	4
	72	48	19.82	68,306	3	50	7.80	1,170	6,053	48	8.93	2,618,254	3,633	48	6.43	1,125,881	5
	2	46	17.78	1,630	2	42	12.00	1,000	79	45	8.84	31,306	37	45	4.45	7,365	6
	9	45	10.47	4,277	.....	.....	.....	.....	85	35	7.35	22,118	166	44	4.78	34,734	7
	41	46	16.37	30,837	2	46	11.89	1,000	663	46	8.83	271,688	1,259	48	5.44	325,270	8
	36	46	14.69	24,277	6	47	6.84	1,937	865	45	7.87	305,782	907	47	4.28	181,835	9
	21	46	19.14	18,345	2	29	9.60	560	133	44	8.90	52,552	157	45	5.51	38,887	10
	27	47	22.72	28,592	4	38	7.33	1,100	785	45	7.26	257,420	718	46	4.96	164,534	11
	.....	.....	.....	.....	.....	.....	.....	.....	20	41	9.92	8,188	158	38	5.02	29,750	12
	35	46	16.26	25,982	1	48	7.83	375	2,819	47	8.79	1,160,646	1,659	46	5.98	457,670	13
	5	50	18.80	4,700	.....	.....	.....	.....	205	47	7.59	73,667	135	50	5.99	40,019	14
	515	49	21.37	339,417	39	50	9.20	17,777	19,478	49	8.79	8,319,824	14,113	49	6.03	4,155,330	15
	26	46	18.36	21,917	1	31	2.40	75	377	46	7.96	137,052	458	47	5.28	113,873	16
	7	42	29.42	9,806	1	50	14.40	720	179	45	8.39	67,753	148	47	4.74	32,915	17
	2	25	27.00	1,350	.....	.....	.....	.....	383	48	8.14	149,616	384	49	4.95	92,800	18
	18	39	13.64	9,477	4	43	8.19	1,408	191	34	7.93	51,464	262	40	5.25	55,535	19
	55	48	23.57	61,782	6	47	8.48	2,404	3,629	48	8.67	1,525,023	3,196	49	6.11	956,602	20
	51	48	20.44	49,667	1	50	26.00	1,300	2,949	49	8.51	1,222,428	2,781	49	4.98	684,605	21
	346	46	20.25	321,377	14	42	8.81	5,192	11,637	47	9.09	4,949,948	11,481	48	5.91	3,225,142	22
	6	47	16.59	4,700	.....	.....	.....	.....	138	43	5.66	33,529	147	45	3.86	25,708	23
	36	48	17.19	29,404	4	50	6.62	1,324	616	44	8.69	233,921	1,112	46	4.42	228,522	24
	25	48	12.42	14,900	.....	.....	.....	.....	148	38	12.89	72,406	31	28	6.95	6,087	25
	502	47	18.91	442,169	75	47	7.48	26,533	16,794	47	9.84	7,698,239	16,776	46	6.30	4,836,025	26
	152	49	17.49	130,654	4	50	7.19	1,438	8,339	49	8.98	3,660,631	6,586	50	6.20	2,023,010	27
	18	43	16.64	12,825	.....	.....	.....	.....	332	43	6.48	91,636	412	46	4.02	75,324	28
	14	50	24.00	16,800	.....	.....	.....	.....	101	47	10.91	52,100	156	50	5.15	40,150	29
	4	39	16.21	2,550	.....	.....	.....	.....	145	41	10.80	64,834	155	44	5.40	36,583	30
	11	48	15.03	7,859	.....	.....	.....	.....	1,066	48	9.05	464,286	867	48	6.59	274,021	31
	14	45	8.03	5,010	1	42	3.36	140	288	44	7.13	90,852	220	42	4.67	43,160	32
	6	39	6.81	1,590	1	29	1.71	50	127	34	7.34	31,790	95	39	4.31	15,788	33
	45	46	19.89	40,850	4	40	15.54	2,460	653	47	8.62	261,987	944	48	4.51	204,889	34
	.....	.....	.....	.....	2	40	7.20	570	28	35	10.49	10,185	45	41	4.79	8,915	35

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 2; Florida, 1; Idaho, 1; Kansas, 2; Nebraska, 1; South Carolina, 1; South Dakota, 2; Washington, 1.

TABLE 11.—CLASSIFICATION OF EMPLOYÉS AND WAGES IN ALL CLASSES

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

	STATES AND TERRITORIES.	Operatives and skilled—Continued.				Unskilled.					
		Children.				Males above 16 years.				Females above 15 years.	
		Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.
1	The United States	12,761	47	$3.34	$2,013,239	4,333	47	$8.41	$1,728,113	432	48
2	Alabama	250	50	1.94	24,300	1	50	6.00	300		
3	Arkansas	3	33	1.56	156						
4	California	24	15	4.24	1,554	28	26	10.73	7,823		
5	Connecticut	498	49	3.58	86,599	277	48	8.84	116,487	43	49
6	Delaware	39	43	2.63	4,426	8	45	9.58	3,472		
7	Georgia	71	44	2.18	6,835	12	43	6.75	3,472		
8	Illinois	66	45	3.15	9,361	34	49	7.91	13,220	40	49
9	Indiana	131	47	2.08	12,789	38	47	7.59	13,575		
10	Iowa	15	46	2.78	1,908	15	46	8.45	5,860	2	50
11	Kentucky	178	47	3.03	25,105	36	45	8.72	14,124	10	50
12	Louisiana					1	38	9.60	360		
13	Maine	150	47	3.21	22,659	205	47	7.45	71,525	2	50
14	Maryland	68	50	4.31	14,515	5	50	8.80	2,200		
15	Massachusetts	1,678	49	3.56	292,711	1,001	49	8.51	418,655	73	48
16	Michigan	30	37	2.69	3,018	24	49	6.43	7,581		
17	Minnesota	1	29	3.29	96	6	45	10.14	2,725		
18	Mississippi	224	49	2.53	27,742	6	42	7.20	1,800		
19	Missouri	59	32	2.75	5,240	12	33	7.40	2,898		
20	New Hampshire	213	50	3.54	37,386	207	49	8.36	84,246	107	50
21	New Jersey	290	48	3.53	49,433	149	49	8.26	60,206		
22	New York	1,941	48	3.39	315,210	598	46	8.53	232,402	31	43
23	North Carolina	60	48	2.66	7,693	18	49	4.87	4,283		
24	Ohio	196	48	2.95	27,987	40	48	7.76	15,045	1	13
25	Oregon	23	47	3.37	3,625	16	42	8.33	5,555		
26	Pennsylvania	4,521	46	3.47	715,276	1,038	47	8.89	432,700	67	47
27	Rhode Island	1,705	50	3.30	279,171	363	49	8.01	143,733	44	50
28	Tennessee	112	49	2.19	12,101	24	45	6.71	7,251	3	50
29	Texas	41	48	2.84	5,580	12	47	8.42	4,700		
30	Utah	19	36	2.32	1,584	5	38	8.39	1,600		
31	Vermont	39	49	3.14	5,932	80	47	7.53	28,412		
32	Virginia	30	45	2.92	3,982	13	44	5.27	2,994		
33	West Virginia	10	32	1.18	374	6	38	4.01	918		
34	Wisconsin	72	47	2.57	8,781	54	47	6.98	17,541	9	50
35	All other states	4	9	2.93	110	1	50	9.00	450		

OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Unskilled—Continued.						PIECEWORKERS—AVERAGE NUMBER EMPLOYED AND TOTAL WAGES.								
Females above 15 years—Continued.		Children.				Summary.		Males above 16 years.		Females above 15 years.		Children.		
Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
$5.31	$110,729	187	48	$3.16	$28,229	46,246	$13,208,577	8,869	$3,823,395	35,632	$9,141,431	1,745	$243,751	1
						9	1,678			9	1,678			2
														3
						63	19,661	8	2,053	55	17,608			4
7.34	15,298	28	49	3.95	5,454	2,284	630,082	350	141,236	1,877	475,531	57	13,315	5
						125	44,528	52	25,220	73	19,308			6
						166	19,967	10	1,500	126	16,140	30	2,327	7
4.80	9,440	3	50	3.00	450	604	110,376	15	4,035	585	106,217	4	124	8
		1	42	2.40	100	1,032	185,756	188	32,912	803	148,944	41	3,900	9
5.00	500	1	50	2.74	137	24	6,276	3	1,200	21	5,076			10
5.00	2,500					222	58,144	13	4,824	209	53,320			11
						100	4,705			100	4,705			12
4.00	400					489	139,985	143	71,197	346	68,788			13
						252	33,646	2	450	185	27,476	65	5,720	14
6.09	21,135	11	48	3.95	2,088	5,947	1,915,203	1,182	544,048	4,612	1,343,844	153	27,311	15
						462	69,125	14	3,278	446	65,727	2	120	16
						101	29,453	1	100	100	29,353			17
						72	23,032	13	6,369	59	16,663			18
						49	10,274	7	2,099	42	8,175			19
5.30	28,245	12	49	3.46	2,038	1,859	488,636	332	118,728	1,492	365,241	35	4,667	20
						953	236,146	142	55,793	765	174,208	46	6,145	21
4.04	5,422	11	44	3.49	1,700	11,465	3,329,354	1,992	790,757	9,291	2,507,475	182	31,122	22
						115	10,965	8	875	83	8,590	24	1,500	23
4.80	60					1,191	256,763	32	13,150	1,126	238,981	33	4,632	24
						140	54,865	37	18,507	103	36,358			25
4.57	14,329	76	46	2.71	9,498	14,654	4,673,486	3,899	1,793,661	9,870	2,760,261	885	119,564	26
5.14	11,300	37	50	3.25	6,014	1,971	558,506	333	157,779	1,504	380,607	134	20,120	27
5.00	750	4	50	2.50	500	40	3,475	3	185	29	2,800	8	490	28
						32	18,150	12	7,600	20	10,550			29
														30
		2	50	2.00	200	192	66,199	19	7,459	172	58,590	1	150	31
						14	2,065	9	1,511	4	545	1	9	32
		1	46	1.09	50	31	5,178	9	2,130	22	3,048			33
5.00	1,350					1,525	181,765	29	9,739	1,452	169,491	44	2,535	34
						63	21,133	12	5,000	51	16,133			35

TABLE 12.—CLASSIFICATION OF EMPLOYÉS AND WAGES IN EACH CLASS

	CLASSES BY STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. (a)									
		Aggregates.			Officers or firm members actively engaged in the industry or in supervision.						
					Males above 16 years.				Females above 15 years.			
		Number of establishments.	Average number.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.
1	Woolen mills	1,311	79,351	$28,478,931	1,567	40	$26.71	$1,687,495	12	29	$13.11	$4,505
2	Alabama	6	16	3,125	3	30	11.31	1,025				
3	Arkansas	6	31	6,231	9	28	11.80	2,950				
4	California	8	1,264	287,658	22	46	22.93	23,120				
5	Connecticut	55	5,173	2,035,462	79	47	36.21	134,635	1	50	10.00	500
6	Delaware	3	297	103,395	5	47	41.43	9,668				
7	Georgia	14	179	32,401	12	18	30.75	6,790				
8	Illinois	23	914	313,789	28	38	25.99	27,745				
9	Indiana	45	2,103	600,062	68	37	25.11	62,886	2	33	18.75	1,250
10	Iowa	14	378	133,240	15	36	18.43	9,945				
11	Kentucky	40	1,803	554,544	50	35	28.52	49,486				
12	Maine	75	4,323	1,629,888	83	39	30.98	101,474	2	13	20.40	510
13	Maryland	9	383	123,931	7	39	16.18	4,450				
14	Massachusetts	165	19,813	7,586,575	218	46	34.66	347,786				
15	Michigan	32	518	156,128	29	34	16.98	16,468	1	38	10.00	375
16	Minnesota	21	341	120,967	21	31	23.47	15,155				
17	Mississippi	7	1,082	306,270	11	31	29.42	9,930				
18	Missouri	35	510	122,410	35	26	17.22	15,715				
19	New Hampshire	46	4,189	1,643,168	68	47	30.72	97,777				
20	New Jersey	21	4,228	1,481,315	34	48	32.29	52,470				
21	New York	91	2,969	1,046,778	96	36	23.15	80,911				
22	North Carolina	27	324	65,329	19	26	11.69	5,711				
23	Ohio	64	1,032	294,365	71	35	19.26	48,260	1	50	8.00	400
24	Oregon	6	402	175,313	19	36	26.48	17,875				
25	Pennsylvania	264	16,061	5,729,982	295	44	22.51	290,365	2	38	14.40	1,080
26	Rhode Island	40	6,028	2,297,416	60	49	33.54	97,692				
27	Tennessee	49	998	289,657	51	32	22.07	35,705	2	3	14.40	90
28	Texas	4	359	138,795	3	29	15.03	1,315				
29	Utah	9	274	104,156	11	30	32.87	10,955				
30	Vermont	29	1,585	625,440	38	41	24.69	38,475				
31	Virginia	35	444	117,023	30	38	15.76	17,845				
32	West Virginia	30	287	61,919	27	31	11.88	9,872				
33	Wisconsin	32	982	324,772	45	41	22.05	40,200	1	33	9.00	300
34	All other states (b)	6	61	17,436	5	38	14.81	2,839				
35	Worsted mills	143	43,593	15,880,183	255	47	46.25	556,891				
36	Connecticut	10	2,261	875,372	16	49	38.79	30,667				
37	Massachusetts	33	12,021	4,556,997	58	49	56.43	160,603				
38	New Hampshire	4	1,963	678,552	6	50	32.00	9,600				
39	New Jersey	6	954	284,102	10	50	16.03	7,950				
40	New York	16	3,953	1,481,194	33	48	54.90	86,925				
41	Pennsylvania	41	9,453	3,350,113	71	45	38.29	123,170				
42	Rhode Island	28	11,757	4,263,968	45	49	50.74	112,676				
43	All other states (b)	5	1,231	389,885	16	37	43.06	25,300				
44	Carpet mills (other than rag)	173	29,121	11,633,116	213	48	32.41	329,638				
45	Massachusetts	7	5,144	1,892,072	8	50	109.32	43,500				
46	New Jersey	6	585	212,554	5	50	94.80	23,700				
47	New York	15	8,954	3,345,165	27	50	49.32	66,375				
48	Pennsylvania	142	12,674	5,509,805	165	47	23.29	181,813				
49	All other states (b)	3	1,764	673,520	8	46	38.43	14,250				
50	Felt mills	34	2,266	1,041,296	65	46	32.95	97,754				
51	Massachusetts	7	340	140,528	5	50	54.00	13,500				
52	New York	11	820	361,944	19	45	38.85	33,344				
53	Ohio	4	183	92,161	12	50	30.17	18,100				
54	Pennsylvania	3	176	111,682	8	44	24.74	8,660				
55	All other states (b)	9	747	334,981	21	43	26.59	24,150				
56	Wool hat mills	32	3,592	1,363,944	58	44	31.78	81,837				
57	Massachusetts	7	1,045	482,602	15	49	44.73	32,987				
58	New York	5	997	361,512	6	43	79.61	20,400				
59	Pennsylvania	17	1,049	330,050	32	43	14.81	20,450				
60	All other states (b)	3	501	189,780	5	40	40.00	8,000				

a The average weekly earnings per employé are computed from individual reports. The average number of employés reported by each establishment is multiplied by the number of weeks embraced by the term of operation; the result is the number of weeks required for one employé to perform the labor. This number used as a divisor for the total wages produces the true average weekly earnings.

OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Clerks.								Operatives and skilled.								
Males above 16 years.				Females above 15 years.				Males above 16 years.				Females above 15 years.				
Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	
788	47	$16.97	$622,828	69	47	$7.66	$24,909	38,480	47	$8.63	$15,574,144	25,585	47	$5.90	$7,102,070	1
								8	32	5.57	1,440	4	50	2.40	480	2
								7	33	6.04	1,385	12	31	4.69	1,740	3
20	34	27.19	18,470					844	25	8.67	184,535	303	21	6.93	44,915	4
24	47	16.97	19,308					2,992	49	8.51	1,234,374	1,665	49	6.49	524,427	5
2	46	17.78	1,630	2	42	12.00	1,000	79	45	8.84	31,306	37	45	4.45	7,365	6
5	42	12.37	2,577					57	29	6.50	10,799	55	32	3.55	6,183	7
21	45	13.78	13,038					403	46	8.51	158,613	371	47	5.45	94,467	8
31	47	14.24	20,556	5	47	7.02	1,637	752	44	7.77	259,830	752	47	4.34	151,845	9
21	46	19.14	18,345	2	29	9.60	560	132	44	8.85	51,832	151	45	5.52	37,877	10
26	47	22.60	27,780	2	50	7.40	740	684	47	7.02	226,817	627	49	5.17	158,783	11
30	45	15.71	21,182	1	48	7.83	375	2,446	46	8.82	999,684	1,336	45	6.18	373,517	12
								188	47	7.47	66,275	118	49	6.51	37,991	13
135	48	18.38	117,977	8	49	9.64	3,766	11,063	48	8.63	4,565,561	5,989	48	6.42	1,833,259	14
9	41	12.87	4,745	1	31	2.40	75	235	44	7.67	80,040	171	45	4.93	37,611	15
3	44	23.63	3,150	1	50	14.40	720	166	45	8.30	62,271	76	44	4.47	14,915	16
2	25	27.00	1,350					383	48	8.14	149,616	384	49	4.95	92,800	17
17	38	13.58	8,757	2	36	11.35	816	190	34	7.95	51,200	168	38	5.06	32,285	18
31	49	26.28	39,780	4	50	8.91	1,781	2,223	49	8.72	945,486	1,466	49	6.18	443,597	19
52	49	18.38	25,387	1	50	26.00	1,300	1,898	50	8.67	818,094	1,963	50	5.19	509,487	20
54	44	12.33	18,376	1	50	15.60	780	1,290	47	8.74	532,937	981	48	5.58	260,678	21
6	47	16.59	4,700					126	43	5.41	29,029	112	45	3.54	17,708	22
14	44	15.67	9,564					402	41	7.25	119,430	359	44	4.77	74,063	23
25	48	12.42	14,900					148	38	12.89	72,406	31	28	6.95	6,087	24
167	49	17.04	138,039	35	50	5.79	10,124	6,557	47	9.04	2,790,817	4,752	46	5.98	1,307,355	25
56	50	13.66	38,092					3,072	50	8.60	1,311,597	1,868	50	6.32	587,929	26
18	43	16.64	12,825					332	43	6.48	91,636	412	46	4.02	75,324	27
14	50	24.00	16,800					101	47	10.91	52,100	156	50	5.15	40,150	28
4	39	16.21	2,550					145	41	10.80	64,834	95	41	6.02	23,383	29
6	47	14.22	4,000					836	48	8.97	363,291	575	49	6.48	181,466	30
14	45	8.03	5,010	1	42	3.36	140	229	43	6.88	67,627	115	40	3.90	18,060	31
6	39	6.81	1,500	1	29	1.71	50	123	34	7.24	30,199	82	37	4.54	13,688	32
19	47	13.72	12,350	1	33	21.60	720	347	45	8.94	140,886	371	48	4.84	86,520	33
				1	29	11.14	325	22	34	10.87	8,197	28	40	4.88	5,515	34
332	49	22.66	366,947	28	48	8.48	11,379	16,882	48	9.17	7,460,463	17,543	48	5.93	5,036,400	35
11	49	21.07	11,434					1,208	49	9.02	536,130	662	48	6.55	206,700	36
169	50	27.16	147,886	19	50	9.33	8,861	4,740	50	8.85	2,093,718	5,006	50	5.88	1,466,404	37
5	50	30.68	7,670					706	50	8.38	295,898	1,091	50	5.91	322,502	38
7	49	13.87	4,710					299	48	8.75	124,402	503	49	4.19	104,301	39
50	49	21.01	51,291					1,434	49	9.20	642,656	1,543	48	5.98	440,547	40
53	47	18.19	53,803	4	48	5.93	1,136	2,990	45	10.19	1,359,197	4,104	46	5.90	1,108,360	41
81	49	21.17	83,341	3	50	6.81	1,022	5,035	48	9.19	2,241,162	4,283	50	6.18	1,310,043	42
6	47	24.40	6,812	2	25	7.20	360	450	46	8.10	167,300	351	43	5.08	77,543	43
166	48	22.30	178,388	6	50	9.50	2,831	11,269	49	9.72	5,389,809	10,702	49	6.49	3,430,044	44
27	50	24.14	32,483					2,177	50	9.11	988,258	2,264	50	5.30	598,761	45
1	50	30.00	1,500					272	50	7.70	104,336	51	50	4.36	11,106	46
48	50	25.30	60,423					3,126	50	9.58	1,491,135	4,123	50	6.14	1,260,120	47
75	47	19.92	78,982	6	50	9.50	2,831	4,938	48	10.29	2,460,197	3,687	49	7.61	1,362,949	48
5	50	20.00	5,000					756	50	9.16	345,883	577	50	6.83	197,108	49
55	49	21.65	58,732	4	47	7.63	1,430	1,286	48	9.99	620,641	346	48	5.51	91,634	50
9	50	14.10	6,345					276	48	8.04	107,465	34	50	4.47	7,591	51
25	50	20.38	25,477	3	49	8.16	1,190	418	49	9.41	191,719	136	49	5.86	38,701	52
4	50	17.00	3,400					105	50	10.62	55,742	39	50	5.08	9,907	53
2	44	17.26	1,510	1	42	5.76	240	68	44	23.75	70,756	4	42	4.81	802	54
15	48	30.34	22,000					419	48	9.66	194,959	133	47	5.59	34,633	55
31	44	22.37	30,827	3	47	9.27	1,304	1,415	44	9.13	571,414	490	44	5.27	113,714	56
11	49	17.73	9,640	2	50	11.24	1,124	512	49	9.79	245,383	194	50	5.75	55,271	57
15	41	28.22	17,492					341	42	9.43	135,113	32	45	4.80	6,903	58
3	44	15.20	1,995	1	41	4.43	180	374	42	7.13	111,901	131	41	4.21	22,672	59
2	42	20.40	1,700					188	40	10.54	79,017	133	39	5.64	28,868	60

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Woolen goods, Idaho, 1; Kansas, 1; Louisiana, 1; South Carolina, 1; South Dakota, 2. Worsted goods, Kentucky, 2; Maine, 1; Ohio, 1; Wisconsin, 1. Carpets, Connecticut, 2; Rhode Island, 1. Felt goods, Connecticut, 2; Indiana, 1; Maine, 1; Michigan, 1; New Hampshire, 2; New Jersey, 2. Wool hats, Connecticut 2; Maine, 1.

TABLE 12.—CLASSIFICATION OF EMPLOYÉS AND WAGES IN EACH CLASS

	CLASSES BY STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.									
		Operatives and skilled—Continued.				Unskilled.					
		Children.				Males above 16 years.				Females above 15 years.	
		Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.
1	Woolen mills	4,299	46	$3.33	$659,520	1,870	47	$8.29	$733,121	87	47
2	Alabama										
3	Arkansas	3	33	1.56	156						
4	California	24	15	4.24	1,554	28	26	10.73	7,824		
5	Connecticut	132	48	3.63	23,217	128	48	8.43	52,197	14	48
6	Delaware	39	43	2.63	4,426	8	45	9.58	3,472		
7	Georgia	25	35	1.82	1,570	7	42	7.19	2,097		
8	Illinois	24	41	2.42	2,361	15	49	8.00	5,898	10	50
9	Indiana	108	47	2.07	10,389	22	47	8.25	8,504		
10	Iowa	15	46	2.78	1,908	15	46	8.45	5,860	2	50
11	Kentucky	178	47	3.03	25,105	32	47	8.55	12,929	10	50
12	Maine	88	45	3.74	14,859	124	45	8.41	46,736		
13	Maryland	68	50	4.31	14,515	2	50	7.00	700		
14	Massachusetts	701	48	3.61	121,183	444	48	8.90	190,912	21	42
15	Michigan	29	37	2.70	2,918	9	49	6.00	2,650		
16	Minnesota	1	29	3.29	96	2	50	13.10	1,310		
17	Mississippi	224	49	2.53	27,742	6	42	7.20	1,800		
18	Missouri	59	32	2.75	5,240	12	33	7.40	2,898		
19	New Hampshire	142	49	3.64	25,508	133	49	8.23	53,342	10	48
20	New Jersey	78	50	3.30	12,886	92	50	7.98	36,612		
21	New York	191	48	3.38	31,072	64	48	8.52	26,176	3	50
22	North Carolina	29	46	2.39	3,193	15	49	4.78	3,483		
23	Ohio	60	45	3.01	8,109	20	47	6.83	6,471		
24	Oregon	23	47	3.37	3,625	16	42	8.33	5,555		
25	Pennsylvania	1,459	44	3.51	227,779	423	48	8.27	166,167	9	50
26	Rhode Island	347	50	3.56	61,555	102	49	8.11	40,941	5	50
27	Tennessee	112	49	2.19	12,101	24	45	6.71	7,251	3	50
28	Texas	41	48	2.84	5,580	12	47	8.42	4,700		
29	Utah	14	31	1.92	834	5	38	8.39	1,600		
30	Vermont	34	49	2.96	4,952	57	49	7.22	20,073		
31	Virginia	30	45	2.92	3,982	11	43	4.90	2,294		
32	West Virginia	10	32	1.18	374	6	38	4.01	918		
33	Wisconsin	7	41	2.16	621	35	46	7.06	11,302		
34	All other states	4	9	2.93	110	1	50	9.00	450		
35	Worsted mills	3,747	49	3.38	623,345	1,100	49	8.16	437,570	184	50
36	Connecticut	147	48	4.02	28,378	32	42	8.57	11,449		
37	Massachusetts	713	50	3.47	123,431	414	50	8.00	165,587	48	50
38	New Hampshire	15	50	3.30	2,472	33	50	7.94	13,100	97	50
39	New Jersey	78	50	3.52	13,650	19	49	8.94	8,309		
40	New York	285	50	3.60	51,317	81	50	7.80	31,545		
41	Pennsylvania	1,056	48	3.44	173,672	195	46	9.90	88,200		
42	Rhode Island	1,310	50	3.25	211,425	242	49	7.88	94,271	39	50
43	All other states	143	50	2.66	19,000	84	49	6.12	25,109		
44	Carpet mills (other than rag)	1,789	49	3.70	327,647	350	49	9.32	160,425	43	48
45	Massachusetts	135	50	4.25	28,697	79	50	9.17	36,142		
46	New Jersey					19	49	7.07	6,542		
47	New York	716	50	3.53	125,503	67	50	8.86	29,539		
48	Pennsylvania	808	49	3.84	152,150	134	48	10.04	64,972	18	46
49	All other states	130	50	3.28	21,297	51	50	9.11	23,230	25	50
50	Felt mills	123	47	3.35	19,410	70	49	9.17	31,418		
51	Massachusetts	8	50	4.02	1,606	8	50	10.05	4,021		
52	New York	40	49	3.15	6,240	36	49	8.56	15,193		
53	Ohio	13	50	3.38	2,200	3	50	10.75	1,612		
54	Pennsylvania	38	42	4.04	6,396	5	43	11.28	2,444		
55	All other states	24	49	2.51	2,968	18	49	9.22	8,148		
56	Wool hat mills	139	46	2.48	15,922	144	44	7.64	48,192	33	42
57	Massachusetts	35	48	2.72	4,555	7	47	9.70	3,192		
58	New York	36	42	3.72	5,595	29	40	10.38	12,001	12	40
59	Pennsylvania	68	48	1.78	5,772	90	45	6.62	26,949	17	43
60	All other states					18	42	8.02	6,050	4	42

OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.						PIECEWORKERS—AVERAGE NUMBER EMPLOYED AND TOTAL WAGES.								
Unskilled—Continued.														
Females above 15 years—Continued.		Children.				Summary.		Males above 16 years.		Females above 15 years.		Children.		
Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
$4.35	$18,805	68	48	$2.91	$9,443	6,526	$2,042,091	1,780	$752,058	4,487	$1,250,399	259	$39,634	1
						1	180			1	180			2
														3
						23	7,241	8	2,053	15	5,188			4
5.83	3,898	9	48	3.85	1,660	129	41,246	43	20,670	82	19,614	4	962	5
						125	44,528	52	25,220	73	19,308			6
						18	2,385			16	2,260	2	125	7
4.00	2,000					42	9,058	15	4,035	24	5,023	3	100	8
						363	83,165	18	4,912	343	77,953	2	300	9
5.00	500	1	50	2.74	137	24	6,276	3	1,200	21	5,076			10
5.00	2,500					194	50,404	1	144	193	50,260			11
						213	71,551	68	31,525	145	40,026			12
														13
4.10	4,800	6	47	3.55	991	1,228	401,340	412	173,235	708	208,924	108	19,181	14
						34	11,246	6	1,498	26	9,628	2	120	15
						71	23,350	1	100	70	23,250			16
						72	23,032	13	6,369	59	16,663			17
						27	5,490	7	2,099	20	3,400			18
4.46	2,135	12	49	3.46	2,038	100	31,724	26	10,382	59	18,510	15	2,832	19
						134	25,079	1	767	87	18,167	46	6,145	20
4.23	650					309	95,198	33	13,414	267	80,576	9	1,208	21
						17	1,505	4	375	13	1,130			22
						105	27,468	31	12,650	74	14,818			23
						140	54,865	37	18,507	103	36,358			24
3.05	1,372	31	47	2.51	3,623	2,331	793,261	817	347,500	1,464	438,188	50	7,573	25
4.80	1,200	2	50	2.44	244	516	158,166	129	54,608	383	103,154	4	404	26
5.00	750	4	50	2.50	500	40	3,475	3	185	29	2,800	8	490	27
						32	18,150	12	7,600	20	10,550			28
														29
		2	50	2.00	200	37	12,983	10	4,695	26	8,138	1	150	30
						14	2,065	9	1,511	4	545	1	9	31
		1	46	1.09	50	31	5,178	9	2,130	22	3,048			32
						156	31,873	12	4,674	140	27,164	4	35	33
														34
5.75	52,869	44	50	3.56	7,829	3,498	1,326,490	1,109	532,592	2,355	788,448	34	5,450	35
		5	50	4.68	1,170	180	49,444	111	32,440	69	17,004			36
6.90	16,659	3	50	4.89	733	911	373,115	308	148,015	602	224,900	1	200	37
7.38	26,110					10	1,200			10	1,200			38
						38	20,780	10	8,290	28	12,490			39
						527	176,913	174	69,210	353	107,703			40
		1	50	3.12	156	969	442,419	310	190,965	655	250,554	4	900	41
5.18	10,100	35	50	3.30	5,770	684	194,158	122	51,271	533	138,537	29	4,350	42
						179	68,461	74	32,401	105	36,060			43
7.22	15,382	17	50	3.79	3,198	4,566	1,795,754	2,036	980,223	2,331	802,823	199	32,708	44
		2	50	3.64	364	452	163,867	38	21,049	414	142,818			45
						237	65,370	98	29,895	139	35,475			46
						847	312,070	438	181,229	387	126,441	22	4,400	47
4.06	4,982	3	28	3.55	510	2,830	1,200,419	1,454	724,402	1,211	450,209	165	25,808	48
5.72	10,400	12	50	3.87	2,324	200	54,028	8	3,648	180	47,880	12	2,500	49
						317	120,277	118	69,737	160	42,639	39	7,901	50
														51
						143	50,080	42	25,790	100	24,197	1	93	52
						7	1,200			7	1,200			53
						50	20,874	28	17,026	4	1,040	18	2,808	54
						117	48,123	48	26,921	49	16,202	20	5,000	55
3.51	4,833	11	42	2.24	1,026	1,268	494,875	661	360,424	598	133,114	9	1,337	56
						269	130,450	158	99,197	111	31,253			57
3.95	1,878					526	162,130	241	106,912	276	53,881	9	1,337	58
2.94	2,155	11	42	2.24	1,026	322	136,950	189	111,175	133	25,775			59
4.80	800					151	65,345	73	43,140	78	22,205			60

TABLE 12.—CLASSIFICATION OF EMPLOYÉS AND WAGES IN EACH CLASS

	CLASSES BY STATES AND TERRITORIES.	Number of establishments.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. Aggregates. Average number.	Aggregates. Total wages.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Number.	Males above 16 years. Average number of weeks employed.	Males above 16 years. Average weekly earnings per employé.	Males above 16 years. Total wages.	Females above 15 years. Number.	Females above 15 years. Average number of weeks employed.	Females above 15 years. Average weekly earnings per employé.	Females above 15 years. Total wages.
61	Hosiery and knitting mills	796	61,209	$18,263,272	959	44	$26.94	$1,149,132	34	41	$12.37	$17,153
62	Alabama	3	412	64,838	2	50	17.28	1,728				
63	Connecticut	27	3,134	1,073,135	44	47	38.28	78,800				
64	Georgia	4	349	71,952	7	46	19.08	6,160				
65	Illinois	35	1,878	545,109	50	46	25.31	58,062	2	50	13.50	1,350
66	Indiana	9	962	207,519	21	48	25.49	25,700				
67	Iowa	3	9	2,550	2	38	10.93	820				
68	Louisiana	3	284	51,841	6	48	31.83	9,150				
69	Maine	4	260	30,165	1	28	37.33	1,050	2	44	10.29	900
70	Maryland	8	306	61,466	12	50	20.33	12,200				
71	Massachusetts	74	4,675	1,495,260	68	45	23.79	73,018	1	42	12.00	500
72	Michigan	10	848	208,344	17	45	22.85	17,663	1	50	10.00	500
73	Minnesota	3	129	46,356	5	46	37.62	8,700				
74	Missouri	7	125	34,477	5	43	22.50	4,876				
75	New Hampshire	37	3,178	989,130	37	43	27.50	43,456	1	46	21.82	1,000
76	New Jersey	15	1,277	342,600	18	43	31.41	24,310	1	25	6.24	156
77	New York	201	20,299	6,437,308	275	45	28.88	353,547	12	44	12.47	6,652
78	North Carolina	5	184	30,410	5	48	13.03	3,150				
79	Ohio	44	1,898	466,630	45	47	24.52	51,700	2	40	21.09	1,670
80	Pennsylvania	236	15,941	4,732,754	267	43	24.83	286,428	11	36	10.44	4,165
81	Rhode Island	16	1,538	487,350	18	45	29.73	24,034				
82	Utah	5	70	17,020	5	39	15.68	3,070				
83	Vermont	10	718	269,844	8	44	28.29	9,900				
84	Wisconsin	23	2,296	449,724	27	46	32.33	40,080	1	25	10.40	260
85	All other states (a)	14	439	147,490	14	38	21.79	11,530				

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 2; Colorado, 2; Florida, 1; Kansas, 1; Kentucky, 2; Nebraska, 1; Virginia, 2; Washington, 1; West Virginia, 2.

OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYES IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Clerks.								Operatives and skilled								
Males above 16 years.				Females above 15 years.				Males above 16 years.				Females above 15 years.				
Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	
561	45	$19.29	$492,098	67	45	$8.89	$26,770	10,882	45	$9.28	$4,575,452	15,040	46	$5.63	$3,863,222	61
1	50	6.00	300					21	50	8.19	8,596	129	50	4.36	28,116	62
28	48	19.40	25,864	3	50	7.80	1,170	782	48	9.63	360,720	573	48	5.88	162,313	63
4	50	8.50	1,700					28	48	8.41	11,319	111	50	5.17	28,551	64
20	48	18.57	17,799	2	46	11.89	1,090	260	47	9.33	113,075	888	48	5.43	230,803	65
5	42	17.86	3,721	1	50	6.00	300	96	49	8.93	42,177	133	49	4.01	26,150	66
								1	50	14.40	720	6	33	5.05	1,010	67
								19	41	10.16	7,876	158	38	5.02	29,750	68
								5	41	4.12	850	82	48	2.57	10,125	69
5	50	18.80	4,700					17	49	8.89	7,392	17	50	2.39	2,028	70
34	49	14.92	25,086	10	49	8.19	4,026	710	48	9.37	319,439	626	47	6.58	194,044	71
15	48	22.44	16,272					110	47	8.01	41,612	269	48	5.52	71,962	72
5	40	33.28	6,656					13	44	9.50	5,482	72	50	5.00	18,000	73
1	50	14.40	720	2	50	5.92	592	1	50	5.28	264	94	45	5.54	23,250	74
17	45	16.55	12,532	2	42	7.48	623	663	46	8.76	265,039	614	47	6.38	184,503	75
8	42	16.66	5,570					332	43	7.77	111,672	249	45	4.99	56,411	76
174	44	19.32	148,318	10	34	9.48	3,222	5,028	44	8.77	1,956,388	4,666	46	5.74	1,218,193	77
								12	47	8.06	4,500	35	47	4.85	8,000	78
16	50	16.80	13,440	4	50	6.62	1,324	91	47	11.84	50,849	702	48	4.22	141,352	79
182	45	20.61	167,840	28	44	9.81	12,022	1,867	44	10.94	905,371	4,098	43	5.85	1,033,887	80
15	50	12.36	9,221	1	50	8.32	416	231	49	9.59	107,747	435	49	5.85	125,038	81
												60	48	4.57	13,200	82
5	48	15.97	3,859					230	47	9.34	100,995	292	47	6.81	92,555	83
26	44	24.69	28,500	3	42	13.92	1,740	256	48	8.62	106,411	531	48	4.34	110,977	84
				1	50	4.90	245	109	46	9.41	46,958	200	44	5.98	53,004	85

TABLE 12.—CLASSIFICATION OF EMPLOYÉS AND WAGES IN EACH CLASS

	CLASSES BY STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYES IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.									
		Operatives and skilled—Continued.				Unskilled.					
		Children.				Males above 16 years.				Females above 15 years.	
		Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.
61	Hosiery and knitting mills..	2,684	45	$3.05	$367,395	799	46	$8.70	$317,387	85	48
62	Alabama	250	50	1.94	24,300	1	50	6.00	300	.....	.....
63	Connecticut	84	47	3.20	12,707	45	49	10.01	22,071	2	50
64	Georgia	46	49	2.32	5,265	5	45	6.17	1,375	.....	.....
65	Illinois	42	48	3.50	7,000	19	49	7.85	7,722	30	49
66	Indiana	21	49	2.13	2,200	15	48	6.39	4,580	.....	.....
67	Iowa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
68	Louisiana	.....	.....	.....	.....	1	38	9.60	360	.....	.....
69	Maine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
70	Maryland	.....	.....	.....	.....	3	50	10.00	1,500	.....	.....
71	Massachusetts	86	49	3.16	13,239	49	49	7.87	18,801	4	47
72	Michigan	1	42	2.40	100	13	49	6.60	4,206	.....	.....
73	Minnesota	.....	.....	.....	.....	4	42	8.39	1,415	.....	.....
74	Missouri	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
75	New Hampshire	56	50	3.36	9,406	39	47	9.12	16,859	.....	.....
76	New Jersey	117	46	3.92	21,129	13	42	10.85	5,935	.....	.....
77	New York	673	45	3.13	95,483	321	43	8.50	117,948	16	45
78	North Carolina	31	50	2.90	4,500	3	50	5.33	800	.....	.....
79	Ohio	42	50	3.08	6,478	16	49	8.42	6,662	1	13
80	Pennsylvania	1,092	42	3.25	149,507	191	46	9.46	83,968	23	49
81	Rhode Island	48	49	2.63	6,191	19	50	8.99	8,521	.....	.....
82	Utah	5	50	3.00	750	.....	.....	.....	.....	.....	.....
83	Vermont	5	43	4.52	980	23	43	8.37	8,339	.....	.....
84	Wisconsin	65	48	2.61	8,160	17	48	6.96	5,725	9	50
85	All other states	.....	.....	.....	.....	2	50	7.00	700	.....	.....

OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.						PIECEWORKERS—AVERAGE NUMBER EMPLOYED AND TOTAL WAGES.								
Unskilled—Continued.														
Females above 15 years—Continued		Children.				Summary.		Males above 16 years.		Females above 15 years.		Children.		
Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
$4.63	$18,840	47	47	$3.07	$6,733	30,071	$7,429,090	3,165	$1,148,361	25,701	$6,124,008	1,205	$156,721	61
						8	1,498			8	1,498			62
6.00	600	2	50	3.00	300	1,571	408,590	94	37,739	1,456	365,998	21	4,853	63
						148	17,582	10	1,500	110	13,880	28	2,202	64
5.07	7,440	3	50	3.00	450	562	100,718			561	100,694	1	24	65
		1	42	2.40	100	669	102,591	170	28,000	460	70,991	39	3,600	66
														67
						100	4,705			100	4,705			68
						170	17,240			170	17,240			69
						252	33,646	2	450	185	27,476	65	5,720	70
3.57	676					3,087	846,431	266	102,552	2,777	735,949	44	7,930	71
						422	56,029	8	1,780	414	54,249			72
						30	6,103			30	6,103			73
						22	4,775			22	4,775			74
						1,749	455,712	306	108,346	1,423	345,531	20	1,835	75
						539	117,417	28	9,341	511	108,076			76
4.04	2,894	11	44	3.49	1,700	9,113	2,532,963	1,064	394,202	7,908	2,114,677	141	24,084	77
						98	9,460	4	500	70	7,460	24	1,500	78
4.80	60					979	193,095			946	188,463	33	4,632	79
5.14	5,820	30	47	2.96	4,183	8,152	2,079,563	1,101	402,593	6,403	1,594,495	648	82,475	80
						771	206,182	82	51,900	588	138,916	101	15,366	81
														82
						155	53,216	9	2,764	146	50,452			83
3.60	1,350					1,361	146,521	9	1,694	1,312	142,327	40	2,500	84
						113	35,053	12	5,000	101	30,053			85

TABLE 13.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF

	STATES AND TERRITORIES.	Number of establishments.	AGGREGATES.		WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)			
					Males above 16 years.			
			Average number.	Total wages.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.
1	The United States	2,489	219,132	$76,660,742	89,577	7,635	5,478	11,526
2	Alabama	9	428	67,963	36	9	7	5
3	Arkansas	6	31	6,231	16	1	.....	6
4	California	10	1,375	328,824	925	5	156	328
5	Connecticut	98	13,047	4,940,783	6,557	412	321	793
6	Delaware	3	297	103,395	94	2	5	15
7	Georgia	18	528	104,353	125	21	7	25
8	Illinois	58	2,792	858,889	816	105	69	91
9	Indiana	55	3,109	817,387	1,030	212	58	119
10	Iowa	17	387	135,790	186	9	13	13
11	Kentucky	44	2,042	615,055	910	279	78	89
12	Louisiana	4	286	52,517	22	1	9	3
13	Maine	82	5,453	1,991,676	3,148	153	89	466
14	Maryland	17	689	185,397	234	5	17	16
15	Massachusetts	293	43,039	16,154,034	21,176	2,053	1,250	3,152
16	Michigan	43	1,428	390,147	475	79	29	73
17	Minnesota	24	470	167,323	219	14	21	39
18	Mississippi	7	1,082	306,270	402	16	14	240
19	Missouri	42	635	156,887	261	13	6	43
20	New Hampshire	89	9,400	3,341,695	4,006	162	197	475
21	New Jersey	50	7,248	2,416,371	3,222	439	129	721
22	New York	339	37,992	13,033,901	13,037	1,174	857	1,586
23	North Carolina	32	508	95,739	186	85	25	21
24	Ohio	113	3,329	915,656	822	137	54	99
25	Oregon	6	402	175,313	208	1	17	22
26	Pennsylvania	703	55,254	19,764,386	19,172	1,275	1,312	1,264
27	Rhode Island	85	19,325	7,049,109	8,978	445	507	1,297
28	Tennessee	49	998	239,657	425	127	29	124
29	Texas	4	359	138,795	130	2	15	8
30	Utah	14	344	121,176	170	4	17	12
31	Vermont	30	2,303	895,284	1,203	62	76	209
32	Virginia	37	612	166,798	347	93	56	69
33	West Virginia	32	307	67,380	169	36	19	35
34	Wisconsin	56	3,383	810,463	827	201	19	65
35	All other states (b)	11	151	46,098	37	3	.....	5

a In comparing the table of weekly rates and the number of employés at each rate with the average weekly earnings presented in Table 11 it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés at the respective rates.

PAY IN ALL CLASSES OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Males above 16 years—Continued.								Females above 15 years.		
$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	
13,437	10,594	11,011	11,329	8,584	5,483	2,197	2,301	70,361	19,107	1
1	.....	3	6	3	1	1	.....	133	118	2
.....	.....	1	4	2	2	.....	.....	12	10	3
70	39	60	71	50	79	28	30	363	38	4
1,320	765	921	780	576	333	160	167	3,680	773	5
22	5	12	13	6	9	3	2	39	23	6
26	10	2	5	10	7	11	1	166	55	7
66	55	84	108	100	65	28	45	1,303	448	8
151	46	112	103	81	66	45	37	945	660	9
26	17	26	16	25	24	11	6	161	79	10
87	49	47	77	67	67	22	48	732	174	11
1	.....	1	2	.....	4	1	6	158	.....	12
530	554	542	356	195	152	60	51	1,660	416	13
133	7	16	10	9	5	8	8	135	21	14
3,613	2,483	2,786	2,181	1,832	1,040	405	381	14,228	3,858	15
57	48	27	63	37	25	24	13	461	177	16
25	4	34	17	21	22	10	12	149	72	17
22	14	33	14	16	13	6	14	384	112	18
84	24	12	24	25	15	8	7	266	47	19
772	718	632	480	221	186	50	104	3,310	455	20
415	415	252	251	257	191	83	69	2,783	1,057	21
2,100	1,667	1,399	2,222	1,153	730	396	413	11,538	2,933	22
2	3	4	15	20	7	1	3	147	107	23
72	56	66	71	96	64	40	67	1,120	624	24
7	15	28	33	28	21	11	25	31	6	25
2,017	2,324	2,352	3,078	2,832	1,686	531	501	16,961	3,869	26
1,250	1,650	1,277	1,052	666	415	135	184	6,634	1,419	27
27	9	16	16	20	35	9	13	417	339	28
8	13	15	27	11	20	7	4	156	50	29
16	21	17	35	16	15	7	10	155	51	30
272	137	108	107	90	78	40	24	867	231	31
30	19	20	16	19	20	2	3	221	145	32
21	3	7	14	18	15	1	.....	96	60	33
94	79	89	57	71	67	32	53	959	645	34
.....	5	10	5	2	4	3	.....	47	29	35

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 2; Florida, 1, Idaho, 1; Kansas, 2; Nebraska, 1; South Carolina, 1; South Dakota, 2; Washington, 1.

TABLE 13.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY

	STATES AND TERRITORIES.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYES AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—cont'd.						
		Females above 15 years—Continued.						
		$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.
1	The United States	17,098	14,739	8,583	5,563	2,864	1,991	305
2	Alabama	3		5	7			
3	Arkansas		2					
4	California	146	48	48	33	34	9	2
5	Connecticut	728	672	756	420	215	99	12
6	Delaware	3	11					2
7	Georgia	65	21	25				
8	Illinois	331	348	92	40	32	8	1
9	Indiana	118	68	40	9	10	3	
10	Iowa	16	47	10	4	5		
11	Kentucky	512	30	9	2	3	2	
12	Louisiana	158						
13	Maine	310	383	317	110	92	36	1
14	Maryland	16	35	63				
15	Massachusetts	2,912	2,909	2,207	1,211	594	426	86
16	Michigan	110	130	13	14	7	10	
17	Minnesota	36	23	14	2	1		1
18	Mississippi	152	120					
19	Missouri	203	5	1	9		1	
20	New Hampshire	626	1,430	500	142	93	52	11
21	New Jersey	1,052	236	249	135	22	31	
22	New York	3,790	2,113	1,216	860	276	257	74
23	North Carolina	8	24	1	1	3	3	
24	Ohio	343	65	49	3		18	1
25	Oregon	1	5	14	4	1		
26	Pennsylvania	3,189	4,471	2,068	1,462	934	837	86
27	Rhode Island	1,918	1,028	661	1,014	433	128	18
28	Tennessee	34	17	17	6	2		1
29	Texas	40	48	8	5		5	
30	Utah	37	44	14	2	3	2	2
31	Vermont	88	243	121	42	86	40	4
32	Virginia	43	22	11				
33	West Virginia	17	12	1	6			
34	Wisconsin	83	122	53	20	18	13	3
35	All other states	10	7				1	

IN ALL CLASSES OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.										
Females above 15 years—Continued.			Children.					PIECEWORKERS.		
$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	Average number.	Total wages.	
90	17	4	12,948	12,563	333	42	10	46,246	$13,208,577	1
			250	250				9	$1,678	2
			3	3						3
5			24	19	5			63	19,661	4
5			526	509	17			2,284	630,082	5
			39	39				125	44,528	6
			71	71				166	19,967	7
2	1		69	69				604	110,376	8
	1		132	132				1,032	185,756	9
			16	16				24	6,276	10
			178	178				222	58,144	11
								100	4,705	12
		1	150	142	6	2		489	139,985	13
			68	68				252	33,646	14
23			1,689	1,595	63	31		5,947	1,915,203	15
			30	30				462	69,125	16
			1	1				101	29,453	17
			224	224				72	23,032	18
			59	59				49	10,274	19
	1		225	188	37			1,859	488,636	20
		1	290	278	12			953	236,146	21
14	5		1,952	1,876	70	2	4	11,465	3,329,354	22
			60	57		1	2	115	10,965	23
15	2		196	188	8			1,191	256,763	24
			23	21			2	140	54,865	25
10	3	2	4,597	4,506	87	2	2	14,654	4,673,486	26
3	2		1,742	1,719	21	2		1,971	558,506	27
1			116	109	5	2		40	3,475	28
			41	41				32	18,150	29
			19	19						30
12			41	39	2			192	66,199	31
			30	30				14	2,065	32
			11	11				31	5,178	33
	2		72	72				1,525	181,765	34
			4	4				63	21,133	35

TABLE 14.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF

	CLASSES BY STATES AND TERRITORIES.	Number of establishments.	AGGREGATES.		WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)			
					Males above 16 years.			
			Average number.	Total wages.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.
1	Woolen mills	1,311	79,351	$28,478,931	42,705	3,700	2,652	6,734
2	Alabama	6	16	3,125	11	.....	4	2
3	Arkansas	6	31	6,231	16	1	.....	6
4	California	8	1,264	287,658	914	5	156	328
5	Connecticut	55	5,173	2,035,462	3,223	206	178	539
6	Delaware	3	297	103,395	94	2	5	15
7	Georgia	14	179	32,401	81	18	5	16
8	Illinois	23	914	313,780	467	66	18	82
9	Indiana	45	2,103	600,062	873	182	55	99
10	Iowa	14	378	133,240	183	8	13	13
11	Kentucky	40	1,803	554,544	792	264	76	86
12	Maine	75	4,323	1,629,888	2,683	146	88	378
13	Maryland	9	383	123,931	197	4	13	12
14	Massachusetts	165	19,813	7,586,575	11,860	813	767	1,833
15	Michigan	32	518	156,128	282	54	14	52
16	Minnesota	21	341	120,967	192	12	20	36
17	Mississippi	7	1,062	306,270	402	16	14	240
18	Missouri	35	510	122,410	254	13	5	43
19	New Hampshire	46	4,189	1,643,168	2,455	98	118	300
20	New Jersey	21	4,228	1,481,315	2,052	231	26	605
21	New York	91	2,969	1,046,778	1,484	154	59	202
22	North Carolina	27	324	65,329	166	82	23	13
23	Ohio	64	1,032	294,365	507	105	41	77
24	Oregon	6	402	175,313	208	1	17	22
25	Pennsylvania	264	16,061	5,729,982	7,442	653	606	709
26	Rhode Island	40	6,028	2,297,416	3,290	173	155	565
27	Tennessee	49	998	239,657	425	127	29	124
28	Texas	4	359	138,795	130	2	15	8
29	Utah	9	274	104,156	165	4	17	12
30	Vermont	29	1,585	625,440	937	46	36	188
31	Virginia	35	444	117,023	284	90	46	61
32	West Virginia	30	287	61,919	162	36	19	34
33	Wisconsin	32	982	324,772	446	85	14	33
34	All other states (b)	6	61	17,436	28	3	.....	1
35	Worsted mills	143	43,593	15,880,183	18,549	1,384	1,088	2,070
36	Connecticut	10	2,261	875,372	1,267	34	57	112
37	Massachusetts	33	12,021	4,556,997	5,321	627	257	733
38	New Hampshire	4	1,963	678,552	750	10	31	76
39	New Jersey	6	954	284,102	335	78	22	11
40	New York	16	3,963	1,481,194	1,598	174	175	173
41	Pennsylvania	41	9,453	3,350,113	3,319	160	226	171
42	Rhode Island	28	11,757	4,263,968	5,403	256	318	700
43	All other states (b)	5	1,231	389,885	556	45	2	94
44	Carpet mills (other than rag)	173	29,121	11,633,116	11,998	990	624	808
45	Massachusetts	7	5,144	1,892,072	2,291	491	136	367
46	New Jersey	6	585	212,554	297	36	12	20
47	New York	15	8,954	3,345,165	3,268	197	141	193
48	Pennsylvania	142	12,674	5,509,805	5,322	162	323	179
49	All other states (b)	3	1,764	673,520	820	104	12	49
50	Felt mills	34	2,266	1,041,296	1,476	83	36	145
51	Massachusetts	7	340	140,528	298	25	5	47
52	New York	11	820	361,944	498	15	9	39
53	Ohio	4	183	92,161	124	19	6	1
54	Pennsylvania	3	176	111,682	83	.....	2	3
55	All other states (b)	9	747	334,981	473	24	14	55
56	Wool hat mills	32	3,592	1,363,944	1,648	234	118	206
57	Massachusetts	7	1,045	482,602	545	29	29	75
58	New York	5	997	361,512	391	62	17	23
59	Pennsylvania	17	1,049	330,050	499	126	66	87
60	All other states (b)	3	501	189,780	213	17	6	21

a In comparing the table of weekly rates and the number of employés at each rate with the average weekly earnings presented in Table 12 it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés at the respective rates.

PAY IN EACH CLASS OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Males above 16 years—Continued.								Females above 15 years.		
$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	
7,039	5,285	5,168	4,488	3,497	2,389	892	861	25,753	7,598	1
		2	1	2				4	4	2
		1	4	2	2			12	10	3
67	38	60	68	59	79	28	26	303	25	4
591	442	461	308	233	145	63	57	1,680	376	5
22	5	12	13	6	9	3	2	39	23	6
17	2	2	3	8	4	5	1	55	22	7
42	44	40	82	33	34	16	10	381	191	8
116	42	109	90	67	49	34	30	759	546	9
26	17	26	16	23	24	11	6	155	75	10
82	35	38	52	44	60	21	34	639	97	11
443	389	472	342	183	143	56	43	1,339	330	12
131	6	10	8	7	2	4		118	4	13
2,130	1,643	1,575	1,342	862	521	215	159	6,018	1,552	14
37	12	18	51	19	16	7	2	173	88	15
24	4	34	15	13	21	7	6	77	52	16
22	14	33	14	16	13	6	14	384	112	17
84	24	12	23	23	15	6	6	170	41	18
553	331	420	274	153	106	31	71	1,480	247	19
249	254	153	144	195	108	42	45	1,964	578	20
239	125	283	124	131	98	36	33	985	368	21
2	3	4	14	19	2	1	3	112	93	22
45	36	41	43	51	35	14	19	360	195	23
7	15	28	33	28	21	11	25	31	6	24
1,048	1,121	778	783	896	562	151	135	4,798	1,128	25
696	471	347	412	227	124	54	66	1,873	440	26
27	9	16	16	20	35	9	13	417	339	27
8	13	15	27	11	20	7	4	156	50	28
16	20	17	35	16	11	7	10	95	26	29
218	103	86	82	68	65	27	18	575	194	30
20	9	12	9	16	16	2	3	116	100	31
19	2	7	14	17	13	1		83	48	32
57	51	46	45	47	33	15	20	373	220	33
1	5	10	1	2	3	2		29	18	34
2,654	2,801	2,818	2,293	1,580	1,008	340	413	17,755	4,649	35
264	147	212	235	94	53	19	20	662	118	36
1,108	465	708	456	538	217	83	129	5,073	1,177	37
71	336	78	116	14	11	1	6	1,188	153	38
15	26	35	71	22	38	13	4	503	320	39
215	106	174	210	168	101	56	46	1,542	660	40
265	389	642	667	307	316	97	79	4,108	1,191	41
630	1,150	894	599	421	261	67	107	4,325	901	42
86	182	75	19	16	11	4	22	353	129	43
1,654	1,067	1,028	2,842	1,859	652	249	225	10,751	1,680	44
129	270	200	193	272	139	60	34	2,264	946	45
99	67	26	14	5	8	5	5	51	37	46
650	197	128	1,338	254	62	43	65	4,123	382	47
519	493	617	1,216	1,185	410	131	87	3,711	218	48
257	40	57	81	143	33	10	34	602	97	49
259	192	201	181	152	75	66	86	350	130	50
88	26	40	31	19	7	5	5	34	27	51
71	76	113	51	48	35	17	24	139	42	52
10	7	17	20	25	5	1	13	39	12	53
		7	18	18	4	6	25	5	2	54
90	83	24	61	42	24	37	19	133	47	55
200	118	253	156	129	128	45	61	526	226	56
63	24	119	65	36	69	14	22	196	56	57
67	28	68	14	45	35	6	26	44	32	58
47	39	35	37	34	9	16	3	149	98	59
23	27	31	40	14	15	9	10	137	40	60

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Woolen goods, Idaho, 1; Kansas, 1; Louisiana, 1; South Carolina, 1; South Dakota, 2. Worsted goods, Kentucky, 2; Maine, 1; Ohio, 1; Wisconsin, 1. Carpets, Connecticut, 2; Rhode Island, 1. Felt goods, Connecticut, 2; Indiana, 1; Maine, 1; Michigan, 1; New Hampshire, 2; New Jersey, 2. Wool hats, Connecticut, 2; Maine, 1.

TABLE 14.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY

	CLASSES BY STATES AND TERRITORIES.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—cont'd.						
		Females above 15 years—Continued.						
		$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.
1	Woolen mills	5,332	5,093	3,937	2,126	1,079	453	108
2	Alabama							
3	Arkansas		2					
4	California	136	38	38	28	29	7	
5	Connecticut	267	277	236	318	151	48	4
6	Delaware	3	11					2
7	Georgia	33						
8	Illinois	59	66	31	15	17	2	
9	Indiana	94	59	37	9	10	3	
10	Iowa	15	47	9	4	5		
11	Kentucky	512	15	8	2	3	2	
12	Maine	240	275	269	98	91	34	1
13	Maryland	16	35	63				
14	Massachusetts	953	1,022	1,247	720	315	155	48
15	Michigan	30	35	3	8	4	5	
16	Minnesota	21	3					1
17	Mississippi	152	120					
18	Missouri	115	4	1	8		1	
19	New Hampshire	233	496	302	105	61	28	8
20	New Jersey	796	171	235	131	22	30	
21	New York	212	175	146	56	22	5	
22	North Carolina	2	9	1	1	3	3	
23	Ohio	67	53	44	1			
24	Oregon	1	5	14	4	1		
25	Pennsylvania	865	1,477	780	347	123	42	34
26	Rhode Island	265	431	325	207	143	57	5
27	Tennessee	34	17	17	6	2		1
28	Texas	40	48	8	5		5	
29	Utah	22	24	14	2	3	2	2
30	Vermont	64	148	63	26	56	16	
31	Virginia	13	2	1				
32	West Virginia	17	11	1	6			
33	Wisconsin	45	17	44	19	18	7	2
34	All other states	10					1	
35	Worsted mills	4,624	4,108	1,664	1,525	670	424	70
36	Connecticut	191	111	121	51	37	33	
37	Massachusetts	1,275	1,343	810	295	81	59	23
38	New Hampshire	283	697	22	1	11	21	
39	New Jersey	156	16	7	4			
40	New York	137	436	53	86	64	61	37
41	Pennsylvania	1,070	893	300	284	193	173	3
42	Rhode Island	1,442	512	307	794	284	77	7
43	All other states	70	100	44	10			
44	Carpet mills (other than rag)	3,344	1,665	1,503	1,108	643	752	51
45	Massachusetts	472	342	76	113	111	194	8
46	New Jersey	12	2					
47	New York	2,314	442	521	390	73	1	
48	Pennsylvania	482	782	598	583	450	552	43
49	All other states	64	97	308	22	9	5	
50	Felt mills	56	128	33	2			1
51	Massachusetts	7						
52	New York	3	69	24				1
53	Ohio	25	1	1				
54	Pennsylvania	3						
55	All other states	18	58	8	2			
56	Wool hat mills	111	84	26	34	26	13	4
57	Massachusetts	38	43	6	31	7	9	4
58	New York	2	2	1		5	2	
59	Pennsylvania	27	10	4		10		
60	All other states	44	29	15	3	4	2	

IN EACH CLASS OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.								PIECEWORKERS.		
Females above 15 years—Continued.			Children.							
$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	Average number.	Total wages.	
23	2	2	4,367	4,202	138	17	10	6,526	$2,042,091	1
								1	180	2
			3	3						3
2			24	19	5			23	7,241	4
3			141	128	13			129	41,246	5
			39	39				125	44,528	6
			25	25				18	2,385	7
			24	24				42	9,658	8
	1		108	108				363	83,165	9
			16	16				24	6,276	10
			178	178				194	50,404	11
		1	88	80	6	2		213	71,551	12
			68	68						13
6			707	678	20	9		1,228	401,340	14
			29	29				34	11,246	15
			1	1				71	23,350	16
			224	224				72	23,032	17
			59	59				27	5,499	18
			154	134	20			100	31,724	19
		1	78	66	12			134	25,079	20
1			191	177	9	1	4	309	95,198	21
			29	26		1	2	17	1,505	22
			60	52	8			105	27,468	23
			23	21			2	140	54,865	24
2			1,490	1,469	19		2	2,331	793,261	25
			349	326	21	2		516	158,166	26
1			116	109	5	2		40	3,475	27
			41	41				82	18,150	28
			14	14						29
8			36	36				37	12,983	30
			30	30				14	2,065	31
			11	11				31	5,178	32
	1		7	7				156	31,873	33
			4	4						34
20		1	3,791	3,653	116	22		3,498	1,326,490	35
			152	148	4			180	49,444	36
10			716	659	35	22		911	373,115	37
			15	15				10	1,200	38
			78	78				88	20,780	39
9			285	253	32			527	176,913	40
		1	1,057	1,012	45			969	442,419	41
1			1,345	1,345				684	194,158	42
			143	143				179	68,461	43
5			1,806	1,792	14			4,566	1,795,754	44
2			137	137				452	163,867	45
								237	65,370	46
			716	706	10			847	312,070	47
3			811	807	4			2,830	1,200,419	48
			142	142				200	54,028	49
			123	122	1			317	120,277	50
			8	8						51
			40	39	1			143	50,080	52
			13	13				7	1,200	53
			38	38				50	20,874	54
			24	24				117	48,123	55
2			150	145	5			1,368	494,875	56
2			35	30	5			280	130,450	57
			36	36				526	162,130	58
			79	79				322	136,950	59
								151	65,345	60

TABLE 14.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY

	CLASSES BY STATES AND TERRITORIES.	AGGREGATES.			WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK.			
					Males above 16 years.			
		Number of establishments.	Average number.	Total wages.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.
61	Hosiery and knitting mills	796	61,209	$18,263,272	13,201	1,244	960	1,565
62	Alabama	3	412	64,838	25	9	3	3
63	Connecticut	27	3,134	1,073,135	899	47	66	58
64	Georgia	4	349	71,952	44	3	2	9
65	Illinois	35	1,878	545,109	349	39	51	9
66	Indiana	9	962	207,519	137	26	2	9
67	Iowa	3	9	2,550	3	1		
68	Louisiana	3	284	51,841	26	1	9	2
69	Maine	4	260	30,165	6	3	1	1
70	Maryland	8	306	61,466	37	1	4	4
71	Massachusetts	74	4,675	1,495,260	861	68	56	97
72	Michigan	10	848	208,344	155	23	14	16
73	Minnesota	3	129	46,356	27	2	1	3
74	Missouri	7	125	34,477	7		1	
75	New Hampshire	37	3,178	989,130	756	54	47	97
76	New Jersey	15	1,277	342,600	371	84	60	73
77	New York	201	20,299	6,437,308	5,798	572	456	956
78	North Carolina	5	184	30,410	20	3	2	8
79	Ohio	44	1,898	466,630	168	12	7	20
80	Pennsylvania	236	15,941	4,732,754	2,507	174	89	115
81	Rhode Island	16	1,538	487,350	283	16	34	31
82	Utah	5	70	17,020	5			
83	Vermont	10	718	209,844	266	16	40	21
84	Wisconsin	23	2,296	449,724	326	87	5	19
85	All other states (a)	14	439	147,490	125	3	10	14

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 2; Colorado, 2; Florida, 1; Kansas, 1; Kentucky, 2; Nebraska, 1; Virginia, 2; Washington, 1; West Virginia, 2.

IN EACH CLASS OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Males above 16 years—Continued.								Females above 15 years.		
$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	
1,631	1,131	1,543	1,269	1,367	1,231	605	655	15,226	4,824	61
1		1	5	1	1	1		129	114	62
131	90	160	83	92	90	42	40	578	143	63
9	8		2	2	3	6		111	33	64
24	11	44	26	67	31	12	35	922	257	65
34	4	3	12	14	15	11	7	134	102	66
				2				6	4	67
		1	2		4	1	6	158		68
							1	84	80	69
2	1	6	2	2	3	4	8	17	17	70
95	55	144	94	105	87	28	32	641	100	71
14	36	4	6	7	8	17	10	270	77	72
1			2	8	1	3	6	72	20	73
			1	2		2	1	96	6	74
142	48	133	73	48	63	25	26	617	43	75
41	9	28	6	19	27	15	9	250	122	76
858	475	633	485	507	399	238	219	4,704	1,449	77
			1	1	5			35	14	78
12	9	5	6	18	23	25	31	709	407	79
138	282	273	357	392	385	130	172	4,160	1,232	80
24	29	36	41	17	30	14	11	436	78	81
	1				4			60	25	82
54	34	22	25	22	13	13	6	292	37	83
36	27	42	11	22	32	17	28	544	383	84
15	12	8	29	19	7	1	7	201	81	85

TABLE 14.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY

	CLASSES BY STATES AND TERRITORIES.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.						
		Females above 15 years—Continued.						
		$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.
61	Hosiery and knitting mills	3,631	3,661	1,420	768	446	349	71
62	Alabama	3		5	7			
63	Connecticut	156	146	71	26	15	11	8
64	Georgia	32	21	25				
65	Illinois	272	282	61	25	15	6	1
66	Indiana	24	5	3				
67	Iowa	1		1				
68	Louisiana	158						
69	Maine			2			2	
70	Maryland							
71	Massachusetts	167	159	68	52	80	9	3
72	Michigan	79	90	10	6	3	5	
73	Minnesota	15	20	14	2	1		
74	Missouri	88	1		1			
75	New Hampshire	100	234	176	36	21	3	3
76	New Jersey	87	33	7			1	
77	New York	1,122	989	471	328	112	188	36
78	North Carolina	6	15					
79	Ohio	251	9	4	2		18	1
80	Pennsylvania	742	1,309	386	248	158	70	6
81	Rhode Island	211	85	29	13	6	4	6
82	Utah	15	20					
83	Vermont	24	95	58	16	30	24	4
84	Wisconsin	38	105	9	1		6	1
85	All other states	40	43	20	5	5	2	2

IN EACH CLASS OF WOOL MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.								PIECEWORKERS.		
Females above 15 years—Continued.			Children.							
$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	Average number.	Total wages.	
40	15	1	2,711	2,649	59	3		30,071	$7,429,090	61
			250	250				8	1,498	62
2			86	86				1,571	408,590	63
			46	46				148	17,582	64
2	1		45	45				562	100,718	65
			22	22				669	102,591	66
										67
								100	4,705	68
								170	17,240	69
								252	33,646	70
3			86	83	3			3,087	846,431	71
			1	1				422	56,029	72
								30	6,103	73
								22	4,775	74
	1		56	39	17			1,749	455,712	75
			117	117				539	117,417	76
4	5		684	665	18	1		9,113	2,532,963	77
			31	31				98	9,460	78
15	2		42	42				979	193,095	79
5	3	1	1,122	1,101	19	2		8,152	2,079,563	80
2	2		48	48				771	206,182	81
			5	5						82
4			5	3	2			155	53,216	83
	1		65	65				1,361	146,521	84
3								113	35,058	85

TABLE 15.—CUSTOM CARDING MILLS IN THE UNITED STATES, BY STATES: 1890.

NOTE.—In the preceding tables the data relating to custom carding mills are included with statistics of woolen mills.

STATES.	CAPITAL.					Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products.
	Number of establishments.	Value of hired property.	Direct investment.				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
			Total.	Land, buildings and machinery.	Live assets.		Average number.	Total wages.					
The United States	193	$18,065	$385,411	$348,207	$37,204	$13,802	416	$61,618	354	47	15	$332,650	$476,278
Alabama	5	400	6,825	6,750	75	123	7	1,465	7	.....	.....	3,489	5,180
Arkansas	3	.....	11,635	10,800	825	262	4	1,237	4	.....	.....	7,085	9,250
Georgia	3	.....	3,025	3,025	.....	129	5	600	5	.....	.....	5,173	7,200
Indiana	7	900	36,765	34,065	2,700	912	32	3,451	28	4	.....	17,280	23,738
Iowa	3	.....	4,700	4,700	.....	106	7	2,000	7	.....	.....	11,052	14,509
Kentucky	15	200	23,156	21,202	1,954	952	39	5,075	35	1	3	46,894	62,920
Maine	16	800	55,050	43,475	11,575	2,182	32	8,164	23	8	1	41,819	64,633
Michigan	10	4,750	18,295	16,170	2,125	888	26	4,186	19	4	3	19,931	29,109
Minnesota	6	1,000	11,475	11,125	350	1,166	23	3,950	19	4	.....	14,422	20,951
Mississippi	3	.....	3,200	3,200	.....	55	5	1,150	5	.....	.....	4,575	6,250
Missouri	12	1,900	21,799	18,495	3,304	1,007	23	2,003	18	3	2	14,819	21,530
New Hampshire	4	.....	5,925	5,725	200	315	9	1,240	7	1	1	8,443	12,200
New York	21	2,615	54,475	52,295	2,180	1,142	33	4,871	29	2	2	23,126	33,822
North Carolina	13	.....	10,810	10,580	230	397	23	2,071	19	3	1	12,240	17,941
Ohio	7	3,100	14,020	12,470	1,550	705	25	3,125	18	7	.....	7,397	11,763
Pennsylvania	14	1,300	25,233	21,035	4,198	877	21	2,843	20	1	.....	16,782	24,500
Tennessee	19	.....	17,953	17,055	898	467	33	4,366	30	3	.....	27,832	38,135
Vermont	7	500	8,585	7,810	775	795	9	1,650	8	1	.....	9,133	12,783
Virginia	5	.....	16,010	15,450	560	268	9	1,477	9	.....	.....	5,816	9,300
West Virginia	7	.....	10,190	8,500	1,690	88	15	1,450	15	.....	.....	9,943	13,770
Wisconsin	5	600	9,535	8,630	905	615	15	2,169	12	3	.....	6,035	9,305
All other states (a)	8	.....	16,730	15,630	1,100	351	21	3,075	17	2	2	19,364	27,528

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Illinois, 2; Maryland, 1; Massachusetts, 1; Oregon, 1; South Carolina, 1; Texas, 1; Utah, 1.

TABLE 16.—IDLE CAPITAL AND MACHINERY, BY STATES: 1890.

STATES.	Number of establishments.	CAPITAL.				MACHINERY.				
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Sets of cards.	Combing machines.	Spindles.	Looms.	Knitting machines.
Total	267	$6,100,860	$841,916	$2,273,239	$2,985,705	612	35	172,634	a3,018	1,821
California	4	225,000	22,700	76,300	126,000	9	.....	2,815	31	.....
Connecticut	11	635,408	52,400	320,100	262,908	41	.....	3,620	195	148
Illinois	5	24,300	3,800	10,600	9,900	6	.....	840	24	.....
Indiana	10	83,125	13,725	24,500	44,900	17	.....	3,923	74	20
Iowa	7	177,350	17,550	66,000	93,800	16	.....	4,180	68	1
Kansas	5	47,600	2,600	22,000	23,000	6	.....	2,646	5	45
Maine	7	126,200	8,500	31,500	86,200	25	.....	3,830	62	16
Massachusetts	43	1,184,110	135,395	433,150	615,565	135	.....	34,798	770	318
Michigan	9	195,556	16,300	98,151	81,105	15	.....	1,282	12	426
Missouri	4	23,100	2,000	5,300	15,800	4	.....	888	28	9
New Hampshire	9	121,600	17,200	51,000	53,400	10	.....	1,760	52	50
New Jersey	5	255,000	14,300	46,500	194,200	8	3	4,100	194	8
New York	36	899,711	248,700	301,600	349,411	113	.....	24,654	411	391
North Carolina	6	19,440	3,040	8,600	7,800	2	.....	3,240	5	40
Ohio	18	99,100	12,700	38,700	47,700	18	.....	4,204	70	172
Pennsylvania	47	1,265,460	177,310	434,050	654,100	116	23	48,124	635	56
Rhode Island	6	294,500	38,500	160,000	96,000	30	.....	13,572	208	25
Tennessee	6	25,500	5,000	9,500	11,000	5	.....	1,930	42	12
Virginia	5	29,500	3,100	14,400	12,000	6	.....	950	14	11
West Virginia	3	10,200	2,600	4,900	2,700	3	.....	600	18	.....
Wisconsin	8	163,300	16,196	43,888	103,216	7	9	5,270	6	57
All other states (b)	13	195,800	28,300	72,500	95,000	20	.....	5,408	94	16

a Includes 34 hand looms.

b Includes states in which there were less than 3 establishments that were reported as idle during the census year, in order that the value of individual establishments may not be disclosed. These establishments were located as follows: Arkansas, 1; Delaware, 1; Georgia, 1; Kentucky, 1; Maryland, 2; Minnesota, 2; Nebraska, 1; Texas, 1; Utah, 1; Vermont, 2.

TABLE 17.—SHODDY MANUFACTURE,

	STATES	Number of establishments.	CAPITAL.								
			Value of hired property.	Direct investment.							
				Aggregate.	Value of plant.				Live assets.		
					Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	94	$457,713	$3,754,063	$1,675,801	$265,500	$556,990	$853,311	$2,078,262	$923,209	$294,781	$860,272
2	Connecticut	7	6,650	395,336	152,666	14,900	72,275	65,491	242,670	142,500	45,100	55,070
3	Illinois	3	8,000	110,037	62,100	6,600	23,500	32,000	47,937	15,500	10,000	22,437
4	Massachusetts	29	36,200	902,850	445,412	87,200	161,854	196,358	457,438	157,597	92,320	207,521
5	New Hampshire	3	10,463	23,000	14,500	1,000	2,500	11,000	8,500	2,000	1,000	5,500
6	New Jersey	4	160,000	193,225	78,900	14,500	25,400	39,000	114,325	31,600	25,000	57,725
7	New York	12	6,500	482,520	239,261	48,800	92,461	98,000	243,259	107,763	32,770	102,726
8	Ohio	3	12,000	744,530	165,530	30,000	40,000	95,530	579,000	311,000	32,000	236,000
9	Pennsylvania	18	144,000	640,382	359,432	50,000	97,500	211,932	280,950	126,899	40,141	113,910
10	Rhode Island	10	62,500	194,250	119,600	9,000	20,000	90,600	74,650	19,000	9,450	46,200
11	All other states (b)	5	11,400	67,933	38,400	3,500	21,500	13,400	29,533	9,350	7,000	13,183

	STATES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.					POWER.							
		Operatives and skilled—Continued.		Unskilled.			Steam.			Water.				Other power.
										Water wheels.		Turbine wheels.		
		Children.	Wages.	Males above 16 years.	Females above 15 years.	Wages.	Boilers. (Number.)	Engines. (Number.)	Horse power.	Number.	Horse power.	Number.	Horse power.	Number of motors.	Horse power.
12	The United States	38	$672,335	78	16	$34,764	89	62	4,312	23	1,075	38	1,617	3	55
13	Connecticut	8	71,023	3	.....	1,522	9	6	188	6	310	2	135	.....	.....
14	Illinois	.....	29,754	.....	.....	.....	2	2	215	.....	.....	.....	.....	.....	.....
15	Massachusetts	.....	147,339	12	5	5,274	25	18	1,040	8	380	20	799	.....	.....
16	New Hampshire	.....	10,650	.....	.....	.....	.....	.....	.....	1	50	1	30	.....	.....
17	New Jersey	4	33,805	4	3	1,800	4	3	260	.....	.....	4	130	.....	.....
18	New York	6	56,981	8	.....	3,080	10	6	310	2	150	6	303	.....	.....
19	Ohio	20	157,500	12	.....	5,100	8	3	640	.....	.....	.....	.....	1	30
20	Pennsylvania	.....	102,295	30	8	14,164	24	17	1,256	1	15	.....	.....	2	25
21	Rhode Island	.....	48,256	8	.....	3,260	5	5	283	1	40	5	220	.....	.....
22	All other states	.....	14,732	1	.....	564	2	2	120	4	130	.....	.....	.....	.....

	STATES.	MATERIALS USED—continued.									
		Shoddy.		Waste and wool noils.		Camel's hair and noils.		All other animal hair.		Raw cotton.	
		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
23	The United States	45,136,841	$3,447,172	10,997,044	$1,801,290	405,000	$29,300	30,000	$900	24,000	$2,260
24	Connecticut	4,420,000	339,100	685,000	40,300	.....	.....	.....	.....	14,000	1,160
25	Illinois	3,796,000	100,413	.....	.....	.....	.....	.....	.....	.....	.....
26	Massachusetts	13,672,070	992,656	283,587	91,465	.....	.....	.....	.....	.....	.....
27	New Hampshire	1,008,700	65,176	45,000	8,200	.....	.....	.....	.....	.....	.....
28	New Jersey	1,960,000	116,900	776,400	171,000	.....	.....	.....	.....	.....	.....
29	New York	1,610,171	158,506	2,492,000	156,765	.....	.....	.....	.....	.....	.....
30	Ohio	5,205,000	684,000	500,000	280,000	.....	.....	.....	.....	.....	.....
31	Pennsylvania	8,333,900	631,140	4,004,957	317,160	405,000	29,300	30,000	900	.....	.....
32	Rhode Island	3,316,000	281,300	2,210,100	736,400	.....	.....	.....	.....	10,000	1,100
33	All other states	1,815,000	77,981	.....	.....	.....	.....	.....	.....	.....	.....

a Includes pieceworkers and their wages.

BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
							Aggregates.		Officers, firm members, and clerks.			Operatives and skilled. (a)		
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Average number.	Total wages.	Males above 16 years.	Females above 15 years.	Wages.	Males above 16 years.	Females above 15 years.	
$238 094	$32,488	$13,084	$28,554	$53,814	$24,858	$85,296	2,299	$856,582	142	2	$149,483	1,174	849	1
28,099	400	1,391	3,027	7,029	5,320	8,932	180	85,816	12	2	13,271	139	16	2
11,610	400	395	544	525	4,500	5,246	114	36,254	4	.....	6,500	37	73	3
62,687	2,950	5,268	6,748	18,274	2,004	27,443	435	180,748	29	.....	28,135	288	101	4
1,785	875	180	190	550	.....	.....	25	11,683	1	.....	1,033	24	.....	5
20,150	8,500	900	725	2,375	1,500	6,150	127	43,755	10	.....	8,150	60	46	6
11,640	650	1,068	2,307	2,280	3,185	2,150	192	77,361	19	.....	17,300	132	27	7
28,286	1,200	1,646	5,600	2,100	5,500	12,220	696	182,700	12	.....	20,100	107	485	8
50,305	12,147	1,273	6,206	12,863	1,636	16,180	339	151,175	37	.....	34,716	181	83	9
22,278	4,546	622	3,197	6,200	1,113	6,600	146	68,014	14	.....	16,498	121	3	10
3,264	820	341	10	1,618	100	375	45	19,076	4	.....	3,780	25	15	11

MACHINERY.						MATERIALS USED.					
	Combing machines.		Spindles.	Looms on woolen goods.			Foreign wool in condition purchased.		Domestic wool in condition purchased.		Total foreign and domestic wool in scoured pounds.
Cards. (Sets.)	Foreign.	American.	Woolen.	Broad.	Narrow.	Total cost.	Pounds.	Cost.	Pounds.	Cost.	
470	1	1	3,170	6	16	$6,003,035	521,000	$84,930	784,400	$297,238	953,400	12
47	.....	.....	510	6	.....	442,852	80,000	12,000	100,000	18,000	98,000	13
12	.....	.....	.....	.....	.....	103,722	.....	.....	.....	.....	.....	14
167	.....	.....	240	.....	16	1,170,868	10,000	6,000	22,400	11,448	32,400	15
12	.....	.....	.....	.....	.....	86,816	15,000	11,250	.....	.....	15,000	16
19	.....	.....	.....	.....	.....	301,113	.....	.....	.....	.....	.....	17
36	.....	.....	.....	.....	.....	343,012	.....	.....	3,000	750	3,000	18
43	.....	.....	.....	.....	.....	1,100,480	16,000	11,680	108,000	63,600	124,000	19
62	1	1	450	.....	.....	1,205,258	400,000	44,000	296,000	76,000	429,000	20
58	.....	.....	1,970	.....	.....	1,165,235	.....	.....	249,000	126,000	249,000	21
14	.....	.....	.....	.....	.....	83,679	.....	.....	6,000	1,440	3,000	22

MATERIALS USED—continued.

Yarns not made in mill.				Oil.		Soap.		Chemicals and dyestuffs.	Fuel.			Rent of power and heat.	All other materials.	
Woolen.		Cotton.							Total cost.	Coal.	Wood.			
Pounds.	Cost.	Pounds.	Cost.	Gallons.	Cost.	Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost.	
10,000	$4,000	25,000	$5,000	296,221	$89,245	267,200	$7,075	$78,519	$88,751	$88,291	$460	$5,809	$61,536	23
.....	.....	25,000	5,000	12,834	3,896	22,000	700	7,596	10,500	10,200	300	300	4,360	24
.....	.....	.....	.....	2,900	860	19,000	480	.....	1,835	1,835	.....	134	.....	25
.....	.....	.....	.....	70,333	26,552	22,500	450	13,620	22,769	22,769	.....	788	5,120	26
.....	.....	.....	.....	2,175	1,050	38,200	1,080	.....	60	.....	60	.....	.....	27
.....	.....	.....	.....	16,209	4,723	1,250	25	1,800	5,765	5,765	.....	500	400	28
10,000	4,000	.....	.....	13,070	3,992	5,000	100	7,223	6,576	6,576	.....	900	4,200	29
.....	.....	.....	.....	47,500	16,900	56,250	1,150	28,900	14,250	14,250	.....	.....	.....	30
.....	.....	.....	.....	113,000	24,252	2,000	70	16,600	18,026	18,026	.....	1,300	46,510	31
.....	.....	.....	.....	14,020	5,780	101,000	3,020	2,780	6,605	6,555	50	1,300	950	32
.....	.....	.....	.....	4,180	1,240	.....	.....	.....	2,365	2,315	50	587	66	33

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 1; Maine, 2; Vermont, 1; Wisconsin, 1.

TABLE 17.—SHODDY MANUFACTURE,

	STATES.	PRODUCTS.								
		Aggregate value.	Horse blankets, all wool.		Boot and shoe linings.		Partly manufactured goods for sale.			
							Total.		Shoddy and mungo.	
			Square yards.	Value.	Dozens.	Value.	Pounds.	Value.	Pounds.	Value.
1	The United States....	$7,887,000	30,000	$24,000	54,000	$20,000	45,999,391	$7,750,997	37,002,054	$5,911,219
2	Connecticut	648,060	30,000	24,000	54,000	20,000	4,337,000	604,060	2,398,000	390,760
3	Illinois	182,110					2,528,616	167,607	2,528,616	167,607
4	Massachusetts	1,614,459					11,384,508	1,614,459	10,018,424	1,418,817
5	New Hampshire	111,848					911,763	111,848	911,763	111,848
6	New Jersey	389,640					1,616,000	389,640	1,252,000	315,640
7	New York	471,478					2,820,717	411,578	2,616,000	383,200
8	Ohio	1,377,500					4,800,000	1,377,500	4,800,000	1,377,500
9	Pennsylvania	1,633,770					12,317,832	1,633,770	9,507,875	1,366,663
10	Rhode Island	1,350,792					3,984,379	1,333,192	1,711,000	274,741
11	All other states	107,343					1,298,576	107,343	1,258,376	104,443

a Includes items as follows: rags, $14,503; batts, $59,900; custom work, $17,600.

BY STATES: 1890—Continued.

PRODUCTS—continued.										
Partly manufactured goods for sale—Continued.									All other products. (a)	
Woolen yarn—all wool.		Woolen card rolls.		Worsted noils.		Waste.		Wool extract.		
Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.	
443,739	$82,432	200	$100	500,000	$335,000	4,544,597	$948,026	3,508,801	$474,220	$92,002	1
						139,000	17,300	1,800,000	196,000		2
										14,503	3
						166,000	16,600	1,200,084	179,042		4
											5
								364,000	74,000		6
						60,000	3,200	144,717	25,178	59,900	7
											8
350,000	40,000					2,459,957	227,107				9
93,739	42,432			500,000	335,000	1,679,640	681,019			17,600	10
		200	100			40,000	2,800				11

COTTON MANUFACTURE.

BY EDWARD STANWOOD.

The statistics pertaining to cotton manufacture prior to the census of 1840 are meagre and not altogether trustworthy. It was found impossible to reduce them to tabular form for the purpose of comparison with subsequent reports. Therefore, the figures for previous censuses shown in this report are confined to the past five decades. Table No. 1 is a résumé of the statistics pertaining to the cotton industry from 1840 to 1890, inclusive, all the items that were common to a number of census reports being presented.

The growth of the industry during the past ten years is shown in the following statement which presents the leading facts as reported by the censuses of 1890 and 1880:

COTTON MANUFACTURE, SUMMARY: 1890 AND 1880.

ITEMS.	1890	1880	Increase.	Per cent.
Number of establishments	905	756	149	19.71
Capital	*a* $354,020,843	$208,280,346	$145,740,497	69.97
Miscellaneous expenses	$16,716,524	(*b*)	.....	.....
Average number of employés (aggregate)	221,585	174,659	46,926	26.87
Total wages	$69,489,272	$42,040,510	.....	.....
Officers, firm members, and clerks	2,709	2,115	594	28.09
Total wages	$3,464,734	(*b*)	.....	.....
All other employés	218,876	172,544	46,332	26.85
Total wages	$66,024,538	$42,040,510	$23,984,028	57.05
Cost of materials used	$154,912,979	$102,206,347	$52,706,632	51.57
Value of products	$267,981,724	$192,090,110	$75,891,614	39.51
Number of active spindles	14,188,103	10,653,435	3,534,668	33.18
Number of looms	324,866	225,759	99,107	43.90
Bales of cotton consumed	2,261,600	1,570,344	691,256	44.02
Pounds of cotton consumed	1,117,945,776	750,343,981	367,601,795	48.99

a Does not include the value of "Hired property". *b* Not reported.

In presenting the figures relative to cotton manufacture, it should be premised that the establishments here reported are exclusively those engaged in spinning or weaving raw cotton, together with those which convert the waste of cotton mills into a commercial product. The tables do not cover the operation of any establishments for the manufacture of hosiery and knit goods, nor any of those principally engaged in making elastic fabrics or cotton cordage and twines. Moreover, all mills in which mixed textiles are produced are excluded. An inspection of the table which shows the materials of manufacture discloses the fact that less than one-half of 1 per cent of the total value of the fiber entering into the materials of these mills was other than cotton. The comparison is made with those mills which were classed in the census report of the Tenth Census as "specific cotton mills", from which category the special agent excluded "mills employed in working raw cotton, waste, or cotton yarn into hose, webbing, tapes, fancy fabrics, or mixed goods, or other fabrics, which are not sold as specific manufactures of either cotton or wool". The comparison is, therefore, as nearly as possible, between the same classes of mills. But the facts regarding what were grouped under the head of "special mills" in the report for the Tenth Census are now distributed among several classes of manufacture.

CAPITAL.

A comparison of capital employed in the industry in 1880 and 1890 is not to be relied upon as an indication of the increase that has actually taken place. The inquiry at the Tenth Census was not so minute as that employed in the present investigation. At the census of 1890 the purpose was to ascertain the actual value of the property at the time the report was made, whether real estate, stock on hand, or money and book accounts, and whether owned or borrowed. It is evident that the more detailed inquiry results in a considerable apparent increase of capital reported. In other words, it is believed the amount of capital now shown is much more nearly the real capital engaged in the manufacture than that reported at the former census, and the indicated increase is considerably in excess of the real increase.

The full details of spindles in the several states are to be found in the following table:

GENERAL STATEMENT OF COTTON SPINDLES IN THE UNITED STATES, 1890 AND 1880, BY STATES.

	Total cotton spindles.	Active spindles in cotton mills.				1890	
		Total.		1890			
	1890	1890	1880	Mule.	Frame.	Idle spindles in cotton mills.	Cotton spindles in woolen mills.
The United States	14,550,323	14,188,103	10,653,435	5,363,486	8,824,617	166,143	196,077
New England states	11,030,458	10,836,155	8,632,087	4,391,895	6,444,260	96,161	98,142
Maine	914,506	885,762	695,924	344,697	541,065	21,744	7,000
New Hampshire	1,198,643	1,195,643	944,053	364,234	831,409	.....	3,000
Vermont	71,591	71,591	55,081	42,735	28,856	.....	.....
Massachusetts	5,895,109	5,824,518	4,236,084	2,430,719	3,393,799	22,257	48,334
Rhode Island	1,994,602	1,924,486	1,764,569	811,869	1,112,617	35,308	34,808
Connecticut	956,007	934,155	936,376	397,641	536,514	16,852	5,000
Middle states	1,736,319	1,633,722	1,391,164	822,613	811,109	20,300	82,297
New York	649,624	606,796	561,658	334,210	272,586	20,300	22,528
New Jersey	374,442	374,442	232,221	304,480	69,962	.....	.....
Pennsylvania	496,551	439,638	425,391	175,687	263,951	.....	56,913
Delaware	53,916	53,916	46,188	2,880	51,036	.....	.....
Maryland	161,786	158,930	125,706	5,356	153,574	.....	2,856
Southern states	1,613,280	1,554,000	542,048	108,474	1,445,526	49,682	9,598
Virginia	94,294	94,294	44,340	13,198	81,096	.....	.....
North Carolina	344,606	337,786	92,385	30,920	306,866	.....	6,820
South Carolina	334,476	332,784	82,334	4,000	328,784	1,692	.....
Georgia	469,468	445,452	198,656	20,524	424,928	24,016	.....
Alabama	83,002	79,234	49,432	9,460	69,774	3,640	128
Mississippi	57,004	57,004	18,568	.....	57,004	.....	.....
Kentucky	42,942	42,942	9,022	8,784	34,158	.....	.....
Tennessee	107,458	97,524	35,736	21,588	75,936	9,134	800
All other states	80,030	66,980	11,575	.....	66,980	11,200	1,850
Western states	170,266	164,226	88,136	40,504	123,722	.....	6,040
Ohio	16,580	16,560	13,328	8,152	8,408	.....	20
Indiana	80,604	74,604	33,396	16,320	58,284	.....	6,000
Illinois	21,800	21,800	.....	8,000	13,800	.....	.....
Wisconsin	32,592	32,592	.....	5,632	26,960	.....	.....
All other states	18,690	18,670	41,412	2,400	16,270	.....	20

THE UNIT OF CAPACITY—THE SPINDLE.

The foregoing table is that which exhibits most broadly and most accurately the capacity of the cotton mills of the United States. The number of working spindles is by no means an exact measure of capacity, but it is by far the best measure. Either the quantity of raw material, that is of cotton, or the superficial area or weight of the product, as such a measure, is open to the fatal objection that the cheapest goods are those in the making of which the largest amount of cotton is consumed. The value, either of raw cotton used or of the finished product of the spindle and the loom, is comparatively useless as a measure of capacity, since a turn in the market might cause a real increase in mill capacity to disappear, while a turn in the other direction might create an appearance of increase when there had been actually a reduction. The imperfection of the spindle as a true measure of capacity is like the imperfection of a chronometer. Since the amount of correction necessary may always be ascertained with a fair degree of accuracy the relative capacity of production at different periods may be learned within a small limit of error. The improvement in spindles during the century of cotton manufacture has been enormous. For the greater part of the time the improvement in the machinery of cotton mills may be said to have been continuous. Numerous changes for the better in the form of the spindle have been made, and the mills have hardly been equipped with spindles of an improved pattern before a still better spindle was offered them. In recent years there has been steady progress, and during no former decade has the necessary correction of the spindle as a measure of productive capacity been so great as it has during the years from 1880 to 1890. Indeed, not to discuss the question whether the modern carding machine or the modern spindle is the more important agent for economy in manufacture, yet so much more attention has been paid to spindles by manufacturers generally that the introduction of better spindles forms the most important feature of the development of the cotton industry that is brought out by the census. There are two types of machinery by which the spinning of cotton is performed, the mule and the spinning frame. Each of these machines has been brought by experiment and invention to a point where it performs its work with such accuracy and excellence that it seems endowed with more than human intelligence, while its speed and capacity of production are so great that a single operative with modern machinery is more than

the equal of a regiment of hand spinners. The self-acting mule was brought to a high state of efficiency before the principle of self-centering spindles, running in loose bearings, for frame spinning had been invented. Consequently the mule was for a long time and perhaps still is in England the favorite machine, especially for the better and finer classes of goods.

The invention of the ring-spinning frame and the wire "traveler" was a great step in advance, and rendered possible the use of rapid spindles. During the last twenty years invention has been applied with marvelous results to the production of spindles capable of high speed. In 1871 the most rapid spindles were capable of making 5,500 turns a minute. The most improved spindles of to-day can be run 9,000 to 10,000 turns. Inasmuch as the amount of yarn that may be made is almost directly proportioned to the speed of the spindle, it follows that a spinning frame of the latest type can make at least 50 per cent more yarn of the same fineness than was the capacity of the best frames in existence in 1870. While this improvement in machinery did not by any means supersede the use of the mule, it did result in an improved quality of yarn from the frame, and the relative cheapness of this method of spinning reversed the tendency toward mule spinning that had long been a feature of the industry. No attempt was made by the census prior to 1870 to ascertain the respective numbers of frame and mule spindles in the cotton mills of the country. The Ninth Census reported 3,694,477 frame spindles, and 3,437,938 in mules. The respective numbers were not ascertained in 1880, but in 1890 it is found that there were 8,824,617 frame spindles and 5,363,486 mule spindles. Thus, in twenty years the percentage of increase of frame spindles has been 138.86 and that of mules 56.01.

THE REVOLUTION IN RING SPINNING.

In no department of industry is there a greater degree of attention paid by manufacturers to the improvement of machinery in the mills than in the cotton industry. The margin of profit depends upon the saving of a fraction of a cent in the price of a pound of cotton and the economy of another small fraction of a cent in working the cotton into yarn or cloth. In order to effect this second economy the most efficient machinery must be provided, and whatever becomes obsolete must be boldly removed from the mill and replaced by what is better. This being the common practice of cotton manufacturers it will readily be seen what the increase in the number of frame spindles in twenty years signifies. In 1870, as has been said, the highest type of frame spindles was capable of a speed of 5,500 revolutions a minute. But inasmuch as the inventions which gave that result were then comparatively recent, a small proportion only of the spinning frames then in use were supplied with them. Since then most of the mills have replaced their frame spindles at least once, and in a large number of cases twice. This will appear from a table appended which shows the number of frame spindles of the self-centering type sold by all the manufacturers of such spindles in the country, for each year of the decade, from May 1, 1880, to April 30, 1890. From this it appears, as a grand result, that 6,000,193 such spindles, all being of the highest capacity and speed ability, were placed in the cotton mills of the country between the dates of the Tenth and the Eleventh Censuses. Roughly speaking, more than two-thirds of all the frame spindles now reported are of the highest type, since most of the important improvements in frame spindles now in use were patented as early as 1880. Moreover, the change effected is not fully represented even by this statement. While all manufacturers are not able to throw aside their machinery and replace it with that of the most modern type, they are frequently enabled to make an improvement. Machinery which, though by no means worn out, is thrown out of certain highly organized mills, because better machinery has been invented, is disposed of to dealers in second-hand machinery, and is by them sold to mills which can not afford to replace their worn-out plant with wholly new machinery. Bearing this in mind we may say with confidence that while two-thirds of all the frame spindles now in use are of the newest type and the highest capacity, and have been introduced in the last ten years, substantially all the rest are equal in spinning power to the best known up to the year 1870. The following table shows by years and by geographical divisions, north and south, the number of frame spindles in new frames and in old frames:

SUMMARY OF FRAME SPINDLES, SALES FROM MAY 1, 1880, TO APRIL 30, 1890.

YEARS.	Grand total.	NORTHERN STATES.			SOUTHERN STATES.		
		Total frames.	New frames.	Old frames.	Total frames.	New frames.	Old frames.
Total	6,000,193	5,131,485	3,561,896	1,569,589	868,708	760,525	108,183
1880-1881	861,626	828,345	534,587	303,758	33,281	24,586	8,695
1881-1882	563,275	529,571	412,983	116,588	33,704	22,132	11,572
1882-1883	589,863	521,943	405,482	116,461	67,920	53,290	14,630
1883-1884	485,207	421,040	290,007	131,033	64,167	55,682	8,485
1884-1885	231,058	190,062	163,042	27,020	40,996	39,429	1,567
1885-1886	343,257	302,439	192,018	110,421	40,818	40,160	658
1886-1887	545,912	480,795	355,451	125,344	65,117	55,210	9,907
1887-1888	493,533	419,798	240,372	179,426	73,735	66,103	7,632
1888-1889	774,630	555,265	403,954	151,311	219,365	179,690	39,675
1889-1890	1,111,832	882,227	574,000	308,227	229,605	224,243	5,362

In the northern mills there were placed 3,561,896 spindles in new frames, a part of which were of the plant of new mills, or of old mills enlarging operations, and a part were new spindles replacing old ones removed, and 1,569,589 spindles in old frames, all of which represent substitution of new machinery for old. The sum of these numbers is 5,131,485, which is 71.52 per cent of all the active frame spindles reported in the cotton mills of the northern states. Including Delaware and Maryland as among the southern states, the spindles in new frames in the south were 760,525; in old frames 108,183; together they were 868,708, or 52.64 per cent of the 1,650,136 active frame spindles in the cotton mil s of that part of the country. The great improvement in the machinery of cotton mills both north and south which is exhibited in these facts is reflected in more than one of the comparisons which are possible between the production of goods in 1880 and in 1890, but in none more clearly than in the statement of the average consumption of cotton per spindle.

IMPROVEMENTS IN MULE SPINNING.

While the great improvements here noted in frame spinning have been taking place, that marvellous piece of machinery, the mule, has been brought nearer to perfection, and its efficacy has been increased nearly, if not quite, as much as that of the frame spindle. Before 1870 the use of the mule was principally for spinning filling; but for print cloths and other medium goods it was used for making warps also. The great impetus which cotton manufacturing received in the early years of the decade which began with 1871, and the improvement in ring spinning compelled the makers of mules to see what invention could do to make their machinery more efficient. At that time the limit of speed of a mule spinning No. 36 yarn, which is the ordinary yarn for filling for print cloths and other medium goods, was 3¼ to 3½ "stretches" of 60 inches per minute. Inferior and old pattern mules made only 3 stretches, or even less, per minute. As in the case of frame spinning, the speed of the spindle fixed the limit of production; that is to say, while it was easily possible to run the machinery at a higher speed, for that was a mere matter of the application of power, the spindle itself could not be made to produce good yarn of the fineness mentioned if run at a higher speed. The efforts of manufacturers were successfully made in several directions. First, the spindle itself was improved, the change taking chiefly the form of improved workmanship. The new spindle was like the old, but it was better made and stronger, the self-centering principle which has made so great a change in frame spindles being adapted to the mule spindle. Inasmuch as the change required only the addition of a self-adjusting bolster and an improved step to spindles already in use, the improvement was much more readily available than one which rendered necessary the discarding of the old spindles. This improvement dates from 1885. The effort at producing a better mule spindle was a result not simply of competition with frame spindles, but of the tendency to the production of finer yarns. The usual twist in No. 36 filling yarn is 19 or 20 turns to the inch, but as yarns become finer the number of turns increases rapidly. In order, therefore, to produce the same length of finer yarn, spindles must be run more rapidly, though the speed of the carriage does not increase; or the carriage must come to a stop while "standing twist" is given to the yarn, before the motion known as backing off and winding begins. The improvement which was adopted chiefly with reference to fine spinning was of great advantage in the spinning of medium counts; for when the available speed of the spindle had become greater than was necessary to give the requisite twist for 3 or 3½ stretches of 60 inches each in a minute, it was possible both to lengthen the stretch and increase the number. Thus, at present the improved mule when spinning No. 36 yarn is capable of making in one minute 4⅞ to 5 stretches of 64 inches each. Indeed, in some cases the stretch is increased to 67 inches by the adoption of a new roller delivery, by which roving continues to be supplied to the amount of 3 inches, one turn of the roller, while the spun yarn is being wound during the return of the carriage. These several improvements have added about 50 per cent to the product of yarn per spindle. The spindle itself had formerly a speed of about 7,000 turns a minute. The new self-centering spindle has a speed of more than 10,000 turns. Since 1884 machinery makers have devoted themselves to strengthening the parts of the mule to enable it to bear the increased speed, and to simplifying it to adapt it to the class of help which the great demand for spinners has required manufacturers to employ; and several other improvements, very important in combination, have been introduced, which are of too technical a character to be described here. Some experimenting has taken place in the direction of a considerable increase in the length of mules. Machines have been made as long as 117 feet and containing 1,100 spindles. The object of this change is partly economical and partly to produce better yarn. One spinner and a helper are employed for a pair of the long mules and breaks are more quickly repaired.

CONSUMPTION OF COTTON PER SPINDLE.

The improvement noted above in both mule and frame spindles does not fully appear in the following table, which shows the consumption of raw cotton per spindle for each of the geographical divisions and for the United States. The increased fineness of goods, which is referred to elsewhere, interferes to complicate the matter. Nevertheless, it should be noted that, taking the country at large, in spite of the greater fineness of yarn spun the average consumption has increased from 70.43 pounds to 78.79 pounds since 1880. In New England, where the average number of yarn, estimated by the only process which is available for purposes of comparison, has increased from 30 to 31.31, the average consumption of cotton has, nevertheless, increased from 62.72 pounds to 65.95 pounds,

and in the south, where the average number is also higher than it was ten years ago, the annual consumption is larger by 5.47 pounds than in 1880. An average of this sort, however, is not very instructive, since, as is explained further on, the consumption of cotton is so very greatly dependent upon the relative coarseness or fineness of the yarn spun. This is evident in the fact that the southern mills consume two and a half times as much cotton to a spindle as those of New England, although the efficiency of southern spindles is, upon the whole, not equal to that of New England spindles. A similar remark may be made as to the teaching of the table on page 167, showing the elements of cost in the product of cotton mills, where it appears that the percentage of cost of cotton is much higher in the southern mills than in the rest of the country. The simple explanation is, of course, that the weight of cotton in the average yard of southern woven goods is much greater than in the New England or middle states.

COTTON CONSUMED PER SPINDLE.

GEOGRAPHICAL DIVISIONS.	1890 (Pounds.)	1880 (Pounds.)
United States	78.79	70.43
New England states	65.95	62.72
Middle states	78.46	78.58
Southern states	161.41	155.04
Western states	147.55	171.55

OTHER IMPROVEMENTS IN MACHINERY.

Other great improvements have taken place in cotton machinery during the last twenty years, and many of them within the last decade. The modern cotton opener is a marvelously more effective machine than that which it superseded, but a still greater improvement is that in cotton cards. It is held by some manufacturers that the new carding machine has introduced an economy in the production of yarn not less important than that in spindles.

LOOMS.

The number of looms in operation in 1890 was 324,866 against 225,759 in 1880; an increase of 99,107 in number, and of 43.90 per cent. The following table shows the number of looms in 1880 and 1890, together with the numerical and percentage increase during the decade for each of the geographical divisions.

NUMBER OF LOOMS: 1890 AND 1880.

GEOGRAPHICAL DIVISIONS.	NUMBER OF LOOMS.		INCREASE.	
	1890	1880	Number.	Per cent.
United States	324,866	225,759	99,107	43.90
New England states	250,116	184,701	65,415	35.42
Middle states	35,074	27,318	7,756	28.39
Southern states	36,266	11,898	24,368	204.81
Western states	3,410	1,842	1,568	85.12

An exhibit is made in the general table relating to machinery of the number of looms at work upon various classes of goods. Inasmuch as the facts of this character were not collected at the Tenth Census no comparison is possible.

THE GEOGRAPHICAL DISTRIBUTION OF THE INDUSTRY.

The geographical distribution of the cotton manufacturing industry is an interesting study, and it is made especially so at the present time by the fact that during the last ten years a change has been taking place, which, if it should continue, will become highly important. New England has been from the beginning the chief seat of the industry. Fifty years ago, when the census first attempted an exact statement of the number of spindles in each of the states, New England had 70 per cent of all the spinning machinery in the country. In 1840 the several New England states ranked in relative importance in cotton spinning exactly as they do to-day. Massachusetts stood first, followed in order by Rhode Island, New Hampshire, Connecticut, Maine and Vermont. The number of spindles was not taken at the census of 1850, but in 1860 we find New England reporting nearly 74 per cent of all the spindles in the United States; in 1870 this group of states had 77 per cent; in 1880 it had 81 per cent; and according to the present census 76 per cent. During this whole period of fifty years, which has seen an increase from 2,284,631 to more than 14,000,000 spindles, New England has retained an almost unvarying proportion of the spindles, and during the whole time the several states of the group have stood in the same relative rank. Moreover the industry has shown an extraordinary steadiness of concentration in certain regions. More than one-fourth of the cotton spindles in the country (29.61 per cent) are in the two adjoining

counties of Bristol in Massachusetts and Providence in Rhode Island. Lowell and Lawrence in Massachusetts, Manchester and Nashua in New Hampshire, Biddeford and Lewiston in Maine, are also large centers of production; and it is still true that either of these centers is more important than any single city outside of New England, except Cohoes, New York. The greatest concentration has taken place in the city of Fall River, Massachusetts, which now reports 41 establishments, having a capital of more than $32,000,000. The mills of this city are very largely devoted to the production of print cloths, of which they turned out during the census year, 443,043,437 square yards, equivalent to very nearly 600,000,000 running yards, or 12,000,000 pieces.

In 1890 Massachusetts contained 41.05 per cent of the entire number of active spindles in the country as compared with 39.76 per cent in 1880, being the only New England state maintaining its percentage in this respect, the percentage of Maine having declined from 6.53 to 6.24; of New Hampshire, from 8.86 to 8.43; of Vermont, from 0.52 to 0.50; of Rhode Island, from 16.56 to 13.56; of Connecticut (the only state in the east which exhibits a decrease in the number of spindles), from 8.79 to 6.58. In the aggregate, although New England added more than 2,000,000 to the number of its spindles, its percentage of the spinning capacity of the country declined from 81.03 to 76.37. The group percentages vary slightly from the sum of state percentages included by reason of the accumulated value of decimals rejected in the details.

GROWTH IN THE SOUTH.

In considering the geographical distribution of the cotton manufacturing industry the most important act is the extraordinary rate of its growth in the south during the past decade. For a great many years, probably ever since the cultivation of the cotton plant in the South Atlantic states had a beginning, domestic spinning and weaving of coarse cotton fabrics has been a common fact in the household economy of that part of the country. Here and there small factories were established for the production of heavy fabrics. It is only within the period since the close of the civil war that mills have been erected in the south for the purpose of entering the general market of the country with their merchandise, and almost all the progress made in this direction has been effected since 1880. According to the Tenth Census there were in the states south of the District of Columbia only 542,048 spindles. If the whole cotton manufacturing in all these states had been concentrated in one state it would have raised that state to the seventh rank only in point of capacity of production A remarkable development of manufacturing enterprise in the south, based on the nearness of supplies of raw material, which began ten years ago, had no more reasonable field in which to exercise itself than that of cotton spinning. New mills sprang up all over the region, but particularly in the states of North Carolina, South Carolina, and Georgia. The number of establishments in these three states, as reported in 1890, is greater by 75 than in 1880, an increase of nearly 73 per cent; but even this does not adequately express the progress that has been made; for a certain number of antiquated mills which have ceased operation forever cause the apparent growth to be less than the real increase. It may be noted, as illustrating the development of the industry in these states, that the average number of spindles to a mill has also increased nearly 73 per cent. The aggregate number of spindles in 1890 was almost three-fold that reported at the previous census. While the largest absolute increase has taken place in these three states there has been quite as large a proportional increase in other states of the south. The table showing the classified products of mills indicates what progress has been made in occupying markets which were previously in the exclusive possession of northern mills. The sheetings and print cloths of the south are consumed in northern homes and southern yarns are woven on Pennsylvania looms and made into hosiery on New York and Pennsylvania knitting frames. While the demand for coarse fabrics for the clothing of colored laborers is still large and is for the most part met by the local production, the mills are also turning out goods of a finer quality, as is indicated by the table which exhibits the average number of yarn spun. The new mills are for the most part equipped with the latest and most approved machinery. The advantages which the south possesses in nearness to the supply of raw material and in the abundance of comparatively cheap labor are partially offset by certain disadvantages, some of which time and experience will cause to disappear. It can not be doubted that the development of this industry in the cotton-raising states is based upon sound commercial reasons, and that it is destined to continue.

The increase of manufacturing in the middle states has been at a slower rate than in any other part of the country. Substantially three-fifths of the increase has been in the state of New Jersey, and is largely due to the development of the spool-thread industry in the great mills in and near Newark. The industry in Pennsylvania is rather of a weaving than of a spinning character. The contrast between these two states is quite marked when we observe that there are in New Jersey nearly 102 spindles to every loom, and only 31 spindles to a loom in Pennsylvania. In Massachusetts, which is both a spinning and a weaving state, the number is nearly 44 spindles to one loom.

The manufacture of cotton goods in the west, while it exhibits a good rate of growth during the decade, is still too small to call for extended notice.

The future development of this industry, considered geographically, depends upon a great variety of conditions, among which may be mentioned the relative cheapness of transportation of the raw material to the several competing regions; nearness to the market where finished goods are sold; economy of power, whether water power or steam; the supply of labor capable of adapting itself to this branch of industry; and the spirit of the state laws regarding the employment of labor. To these considerations some students of the question would

add that the atmospheric conditions must also be taken into account. It is true that while a humid state of of the atmosphere is favorable to good spinning of cotton, particularly of fine yarns, there are certain regions where the degree of natural humidity is both greater and more uniform than it is elsewhere. Nevertheless, the advantage which the climate of the British Isles possesses in this respect has been overcome by mechanical appliances adopted in the American mills, and there seems to be no reason why, if it should be worth while on other accounts to locate mills where the atmosphere is relatively dry, the same means should not be found effectual to neutralize one of the disadvantages imposed by nature.

EMPLOYÉS AND WAGES.

The average number of employés in the cotton industry during the census year, including officers and clerks, was 221,585, an increase of 46,926, or 26.87 per cent. Nearly the whole of this increase occurred in New England and the southern states, and was almost exactly divided between them. The figures which show the number and wages of officers and clerks have significance only as they complete the statistics which indicate the importance of the industry. The facts presented regarding the number and wages of operatives furnish material for some useful deductions.

It should be remarked here that in the spinning and weaving of cotton a very large proportion of the operatives are nominally employed on piecework. The payment of weavers by the "cut" is well-nigh universal, and a very large number of spinners are paid not by the day or the hour but by the number of spindles under their care. It was considered that if all who are employed according to this system were to be classed as pieceworkers the result would give an incomplete and erroneous view of the average earnings of operatives in cotton mills. Moreover, while these operatives are nominally employed as pieceworkers, their wages are in reality so regulated as to enable them to earn a nearly uniform amount from week to week. Consequently an arbitrary rule was adopted that all pieceworkers whose earnings are limited by the speed of machinery were to be included with those paid a specific amount by the week, the day, or the hour. It is probable that many manufacturers in making their returns failed to transfer to the category of wage earners according to the time employed all who should properly have been included in this class. The number of pieceworkers is therefore too large and that of operatives and skilled laborers earning wages is too small, but whatever error there may be corrects itself, and the final result is not affected.

Before taking up the details of the figures relating to the class of "operatives and skilled labor", a few comparisons may be drawn between the number of persons employed, exclusive of officers and clerks, in 1880 and 1890. The number of adult male employés increased 29,152 and of adult females 22,068, while the number of children decreased 4,888. The change in the relative proportion of these three classes in New England mills is marked; for while the number of men increased 18,228 that of women increased but 10,891, and the number of children decreased 7,539. In the southern states, on the other hand, while the number of men increased somewhat more than that of women, the number of children employed was doubled. The proportion of men, women, and children employed (including officers and clerks) in 1890 and 1880 is exhibited in the following table:

PROPORTION OF MEN, WOMEN, AND CHILDREN EMPLOYED (ALL CLASSES): 1890 AND 1880.

GEOGRAPHICAL DIVISIONS.	MEN. (Percentage of all employés.)		WOMEN. (Percentage of all employés.)		CHILDREN. (Percentage of all employés.)	
	1890	1880	1890	1880	1890	1880
United States	41.28	35.36	48.15	48.41	10.57	16.23
New England states	43.75	36.87	49.42	49.20	6.83	13.93
Middle states	37.32	32.29	50.25	46.49	12.43	21.22
Southern states	35.66	30.20	40.62	45.32	23.72	24.48
Western states	32.28	27.30	54.87	51.35	12.85	21.35

The most natural and obvious comparison between the rates of wages in 1880 and 1890 is the result of the general average. According to the census of 1880 there were employed in the cotton mills of the United States 172,544 hands (exclusive of officers and clerks), and the total wages paid to them amounted to $42,040,510. This was an average yearly earning of $243.65. In 1890 the same industry gave employment to 218,876 hands (officers and clerks excluded), and paid them $66,024,538 for their service, an annual average for each person of $301.65. This comparison, taken by itself and without explanation, would naturally be supposed to signify that the average rate of wages throughout the country in this industry has increased in the proportion indicated, that is, by an actual average addition of $58 to the wages of each person employed, more than $1 a week, or by 23.80 per cent. This deduction is not warranted by the facts. It is undeniable that wages have increased. This is proved beyond question by the wage tables of the mills. A glance at the table showing the proportion of men, women,

and children furnishes an abundant explanation of the reason why the apparent increase is greater than the real. It will be seen that the proportion of women employed in New England factories remained almost stationary, the difference between the two periods being only 0.22. The proportion of men increased 6.88 and that of children decreased 7.10. It thus appears that there is a decrease in the class of laborers earning the lowest rate of wages and an increase in the class earning the highest rate.

Turning attention now exclusively to the operatives and skilled laborers, excluding pieceworkers, we find that the sum of $30,761,249 was paid in wages during the census year to an average number of 80,735 adult males, being an average yearly earning of $381.02; $26,019,812 to 95,733 adult females, an average of $271.80, and $2,913,283 to 22,433 children, an average of $129.87 for the year. On the basis of 50 weeks running in each year this is an average weekly wage of $7.62 for men, $5.44 for women, and $2.60 for children. Although, counting each establishment as a unit, the average number of weeks during which all the cotton mills of the country were running appears to have been but slightly more than 49, yet, as a matter of history, the important mills all through the country were running almost continuously, and the basis of 50 weeks is under rather than over the truth. Bringing together the figures for each of the geographical divisions, we have the following exhibit:

GROSS WAGES AND AVERAGE EARNINGS PER YEAR AND PER WEEK OF SKILLED EMPLOYÉS, EXCLUDING PIECEWORKERS, 1890.

GEOGRAPHICAL DIVISIONS.	MEN.				WOMEN.				CHILDREN.			
	Average number.	Total wages.	Average earnings.		Average number.	Total wages.	Average earnings.		Average number.	Total wages.	Average earnings.	
			Yearly.	Weekly.			Yearly.	Weekly.			Yearly.	Weekly.
United States	80,735	$30,761,249	$381.02	$7.62	95,733	$26,019,812	$271.80	$5.44	22,433	$2,913,283	$129.87	$2.60
New England states	58,299	22,785,881	390.85	7.82	65,900	18,906,902	286.90	5.74	9,769	1,549,697	158.63	3.17
Middle states	10,355	4,582,850	434.19	8.68	14,567	4,193,627	287.89	5.76	3,971	536,363	135.07	2.70
Southern states	10,930	3,002,215	274.68	5.49	13,560	2,516,447	185.58	3.71	8,262	773,729	93.65	1.87
Western states	951	390,303	410.41	8.21	1,706	402,836	236.13	4.72	431	53,494	124.12	2.48

From these figures it appears that the highest average wages of both men and women are paid in the middle states, and the highest to children in New England, while the lowest wages to each of the three classes are paid in the southern states. An inspection of the table exhibiting the above facts by states shows that for all classes of working people the rates are more uniform throughout the New England states than in any other part of the country, a circumstance which will cause no surprise to those who know how highly organized factory labor is in the eastern states.

The bearing of the facts relative to actual rates of wages must necessarily be considered in connection with earnings in other branches of industry. In one respect the tables showing the number of employés, the amount of wages, and the number of spindles, when brought together, furnish the material for some useful deductions by manufacturers. It appears from the following table, first, that the number of spindles to each hand employed, taking the country at large, has increased in ten years from 61.74 to 64.82; secondly, that the cost of labor per spindle increased in the same time from $3.95 a year to $4.65. Furthermore, it appears that the number of spindles to each employé is largest in New England, as it was ten years ago, and that the cost of labor per spindle is also lowest in the same geographical division. This, of course, does not signify that wages are lowest in New England, for that is not true. No doubt both the fact now under notice and that just mentioned, which may be put in another form, namely, that fewer hands are required to each 1,000 spindles than elsewhere in the country, are due in some degree to the fact which has already been referred to under the head of "Cost of Plant", namely, that mills spinning and weaving coarse goods require more machinery other than spindles, and consequently more hands than fine mills. Indeed, something like a direct proportion may be established between the average number of yarn spun, for example, in Maine, Massachusetts, and South Carolina, and the number of spindles to each hand, as exhibited in the following table. The labor cost per spindle is complicated by differences in rates of wages and in hours of operation per day. The figures in the following table invite analysis by those who are curious to establish the relationships, and estimate the value of the several elements entering into questions of wages. In some special cases there are local variations which are to be explained on other grounds than any yet mentioned. The immense difference between the showing of New Jersey and that of Pennsylvania is to be ascribed chiefly to the fact that in New Jersey the dominating mills are those for the manufacture of spool cotton thread, while in Pennsylvania the number of spindles is comparatively small and that of looms abnormally large.

NUMBER OF SPINDLES TO EACH EMPLOYÉ, AND THE AMOUNT PAID FOR LABOR TO EACH SPINDLE: 1890 AND 1880.

STATES.		Average number of employés. (a)	Total wages. (a)	Spindles.	Number of spindles to each employé.	Labor cost per spindle.
The United States	1890	218,876	$66,024,538	14,188,103	64.82	$4.65
	1880	172,544	42,040,310	10,653,435	61.74	3.95
New England states	1890	147,359	47,832,943	10,836,155	73.54	4.41
	1880	125,779	32,170,861	8,632,087	68.63	3.73
Maine	1890	13,912	4,213,523	885,702	63.67	4.76
	1880	11,759	2,936,640	695,924	59.18	4.22
New Hampshire	1890	19,383	6,242,204	1,195,643	61.69	5.22
	1880	16,395	4,290,960	944,053	57.58	4.55
Vermont	1890	724	204,538	71,591	98.88	2.86
	1880	721	161,748	55,081	76.40	2.94
Massachusetts	1890	75,544	25,118,365	5,824,518	77.10	4.31
	1880	61,246	15,828,571	4,236,084	69.17	3.74
Rhode Island	1890	24,576	7,814,767	1,924,486	78.31	4.06
	1880	21,174	5,320,303	1,764,569	83.34	3.02
Connecticut	1890	13,220	4,239,546	934,155	70.66	4.54
	1880	14,484	3,632,639	936,376	64.65	3.88
Middle states	1890	31,841	10,184,589	1,633,722	51.31	6.23
	1880	28,118	6,613,260	1,391,164	49.48	4.75
New York	1890	8,316	2,448,031	606,796	72.97	4.03
	1880	9,227	1,994,755	561,658	60.87	3.55
New Jersey	1890	5,632	1,984,659	374,442	66.48	5.30
	1880	4,179	1,156,901	232,221	55.57	4.98
Pennsylvania	1890	12,606	4,388,017	439,638	34.71	9.98
	1880	9,870	2,502,688	425,391	43.00	5.88
Delaware	1890	971	308,346	53,916	55.53	5.72
	1880	791	192,727	46,188	58.39	4.17
Maryland	1890	4,256	1,055,536	158,930	37.34	6.64
	1880	4,042	766,129	125,706	31.10	6.09
Southern states	1890	36,415	7,116,865	1,554,000	42.67	4.58
	1880	16,317	2,750,986	542,048	33.22	5.08
Virginia	1890	1,990	373,993	94,294	47.38	3.97
	1880	1,085	169,789	44,340	40.87	3.83
North Carolina	1890	8,515	1,475,932	337,786	39.67	4.37
	1880	3,232	439,659	92,385	28.58	4.76
South Carolina	1890	8,071	1,510,494	332,784	41.23	4.54
	1880	2,018	380,844	82,334	40.80	4.63
Georgia	1890	10,314	2,167,036	445,452	43.19	4.86
	1880	6,215	1,135,184	198,656	31.96	5.71
Alabama	1890	2,088	402,908	79,234	37.95	5.09
	1880	1,448	239,998	49,432	34.14	4.86
Mississippi	1890	1,154	263,997	57,004	49.40	4.63
	1880	695	133,214	18,568	26.72	7.17
Kentucky	1890	818	170,573	42,942	52.50	3.97
	1880	348	63,850	9,022	25.93	7.08
Tennessee	1890	2,124	444,573	97,524	45.92	4.56
	1880	1,015	161,071	35,736	35.21	4.51
All other states	1890	1,341	307,359	66,980	49.95	4.59
	1880	261	27,377	11,575	44.35	2.37
Western states	1890	3,261	890,141	164,226	50.36	5.42
	1880	2,330	505,403	88,136	37.83	5.73
Ohio	1890	554	161,613	16,560	29.89	9.76
	1880	481	104,500	13,328	27.71	7.84
Indiana	1890	1,309	310,342	74,604	56.99	4.16
	1880	708	162,829	33,396	47.17	4.88
Illinois	1890	430	123,986	21,800	50.70	5.69
	1880					
Missouri	1890					
	1880	338	97,680	19,312	38.02	5.06
Wisconsin	1890	490	131,170	32,592	66.51	4.02
	1880					
All other states	1890	478	163,030	18,670	39.06	8.73
	1880	633	140,394	22,100	34.91	6.35

a Excludes officers or firm members, clerks or salesmen, and their salaries.

MATERIALS USED.

COTTON.

The total quantity of cotton consumed in the establishments reported was 2,261,600 bales, of an aggregate weight of 1,117,945,776 pounds. This includes foreign and sea island with the ordinary varieties of classified cotton. Inasmuch as the publication of a classified statement by states of the cotton consumed would result in the disclosure of certain facts regarding individual establishments, the totals only of the quantities and values of the several varieties of cotton can be here presented:

KINDS OF COTTON.	Bales.	Pounds.	Cost.
Total	2,261,600	1,117,945,776	$117,392,576
Sea island	21,283	7,891,915	1,980,983
Other domestic	2,231,385	1,103,492,910	114,337,802
Egyptian	8,932	6,560,951	1,073,791

The amount paid for cotton is by far the largest item in the expenditures of a cotton mill. The cost of that which is classed as "Other domestic" is 42.67 per cent of the gross value of products.

The average weight of bales of domestic cotton consumed in cotton mills during the census year was 494 pounds, as compared with 478 pounds in 1880. The commercial report of the weight of bales of the whole American crop in 1890 is 496.13 pounds. The increase in the consumption of cotton in the cotton mills of the United States during the ten years, including sea island and foreign cotton, is shown by the following figures:

YEARS.	Bales.	Pounds.
1889–1890	2,261,600	1,117,945,776
1879–1880	1,570,344	750,343,981
Increase in amount	691,256	367,601,795
Increase per cent	44.02	48.99

The total consumption of cotton in the country, including the consumption in woolen mills, for each of the eleven years ending with 1890 is exhibited in the following statement, taken from the accepted commercial reports, except that for the year 1890 the census figures are substituted. Owing to the variation in the weight of bales the amount is stated in pounds.

YEAR.	Pounds.	YEAR.	Pounds.
1880	792,400,000	1886	911,200,000
1881	847,200,000	1887	969,200,000
1882	878,800,000	1888	1,012,000,000
1883	950,000,000	1889	1,074,000,000
1884	897,600,000	1890	1,193,374,641
1885	763,600,000		

The table following presents the facts relative to the consumption of "other domestic" cotton in each of the states and by geographical divisions as ascertained at the Eleventh Census. A comparison is made with the corresponding figures obtained at the Tenth Census. It should be noted that the statistics of 1880 make no distinction between the several kinds of cotton, and consequently the comparison is not strictly between corresponding facts; but the error is a very small one, both because the use of foreign and sea island cotton is so small, comparatively, and because that use is, except in New Jersey, in states where the consumption of ordinary cotton is so great that the percentage can be affected but slightly.

QUANTITY AND COST OF COTTON CONSUMED, BY STATES: 1890 AND 1880.

STATES AND TERRITORIES.	1890							1880			
	Sea island and foreign.			Other domestic.				All cotton.			
	Bales.	Pounds.	Cost.	Bales.	Pounds.	Cost.	Cost per pound.	Bales.	Pounds.	Cost.	Cost per pound.
The United States	30,215	14,452,866	$3,054,774	2,231,385	1,103,492,910	$114,337,802	$0.1036	1,570,344	750,343,981	$86,945,725	$0.1159
New England states	20,321	9,899,494	2,065,270	1,405,637	704,792,220	74,683,860	0.1060	1,129,498	541,373,880	63,169,434	0.1167
Maine				132,504	65,717,252	7,053,168	0.1073	112,381	54,185,061	6,234,901	0.1151
New Hampshire				214,034	107,319,124	11,203,742	0.1044	157,673	76,386,499	8,629,063	0.1130
Vermont				8,954	4,647,889	498,348	0.1072	7,404	3,562,088	458,607	0.1287
Massachusetts	6,747	3,228,105	663,420	765,773	383,539,221	40,206,887	0.1048	574,857	273,718,889	31,107,154	0.1136
Rhode Island	6,733	3,426,367	700,925	186,558	94,555,788	10,446,155	0.1105	167,480	81,137,172	10,457,770	0.1289
Connecticut	6,841	3,245,022	700,925	97,814	49,012,946	5,275,560	0.1076	109,703	52,384,171	6,281,939	0.1199
Middle states	9,894	4,553,372	999,504	251,260	123,630,916	12,917,244	0.1045	228,729	109,321,428	13,258,526	0.1213
New York	653	483,368	78,560	78,171	39,038,689	4,192,105	0.1074	64,614	31,656,594	3,981,106	0.1258
New Jersey	9,241	4,070,004	910,944	16,482	8,231,147	905,524	0.1100	21,069	9,950,609	1,319,422	0.1326
Pennsylvania				92,705	44,629,588	4,371,693	0.0980	83,997	40,311,809	4,749,428	0.1178
Delaware				8,876	4,465,825	475,490	0.1065	7,512	3,236,184	427,855	0.1322
Maryland				55,026	27,265,667	2,972,432	0.1090	51,537	24,166,232	2,780,715	0.1151
Southern states				526,856	250,837,646	24,508,776	0.0977	182,349	84,528,757	8,890,408	0.1052
Virginia				22,731	10,616,206	1,080,773	0.1018	11,461	5,087,519	601,796	0.1183
North Carolina				114,371	53,546,289	5,396,974	0.1008	27,642	11,832,641	1,125,984	0.0952
South Carolina				133,342	64,000,600	6,242,598	0.0975	33,624	15,601,005	1,723,197	0.1105
Georgia				145,859	69,139,410	6,663,560	0.0964	71,389	33,757,199	3,591,554	0.1064
Florida								350	166,250	16,000	0.0962
Alabama				29,962	14,726,454	1,372,058	0.0932	14,702	7,271,791	729,202	0.1003
Louisiana								1,358	644,000	68,018	0.1056
Mississippi				17,366	8,449,834	793,600	0.0939	6,411	2,881,853	301,226	0.1045
Texas								246	119,986	11,280	0.0940
Kentucky				11,980	5,751,305	554,206	0.0964	4,050	1,882,234	188,856	0.1003
Arkansas								680	340,000	25,000	0.0735
Tennessee				33,114	15,779,360	1,554,851	0.0985	10,436	4,944,279	508,305	0.1028
All other states				18,131	8,828,188	850,156	0.0963				
Western states				47,632	24,232,128	2,227,922	0.0919	29,768	15,119,916	1,627,357	0.1076
Ohio				11,023	5,840,078	383,556	a0.0657	5,323	2,506,182	258,198	0.1030
Missouri								6,399	3,082,132	336,984	0.1093
Indiana				16,306	8,240,434	798,178	0.0969	11,558	6,364,887	679,911	0.1068
Michigan								600	300,000	36,000	0.1200
Illinois				6,405	3,207,188	312,621	0.0957	2,261	1,099,130	110,969	0.1010
Minnesota								400	200,000	22,000	0.1100
Wisconsin				6,924	3,470,388	359,117	0.1035	3,173	1,541,797	180,072	0.1168
Utah								54	25,788	3,223	0.1250
All other states				6,974	3,414,040	374,450	0.1097				

a The low cost per pound of cotton reported from the state of Ohio is caused by the inclusion of an establishment using a large quantity of "linter", or low grade cotton.

SEA ISLAND COTTON.

The consumption of sea island cotton during the census year is reported at 21,283 bales. This is much the largest amount ever consumed in a single year, and it exceeds the commercial reports by more than 2,000 bales, or nearly 10 per cent. There is, nevertheless, reason to believe that if there is an error in the present statement the correction required is an increase rather than a diminution of the amount. While a detailed statement of the consumption of this staple can not be made, for reasons already given, it may be said that mills in only four states return sea island cotton as entering into their raw materials—Connecticut, Massachusetts, New Jersey, and Rhode Island: and in these states the use of it is confined almost wholly to the makers of spool thread.

EGYPTIAN COTTON.

The amount of Egyptian cotton used in American mills is now reported by the census for the first time. For the census year 1890 it was 6,560,951 pounds. The return by the Bureau of Statistics of the Treasury Department of the imports of foreign cotton entering into consumption during the fiscal year 1889–1890 amounted to 8,407,160 pounds. It is not improbable that some users of foreign cotton failed to return the amount separately, but included the whole in their return of domestic. The use of Egyptian cotton in spinning fine yarns is increasing. The following table shows the amount of cotton imported from abroad and entering into consumption, together with the value of the same, as reported by the bureau of statistics for each of the ten years ended with 1890:

IMPORTS OF COTTON.

YEARS.	Pounds.	Value.
1881	4,440,996	$757,352
1882	4,339,776	789,944
1883	4,123,058	802,248
1884	7,093,915	1,382,514
1885	5,115,705	954,760
1886	5,072,359	672,508
1887	4,024,531	533,928
1888	5,497,544	744,795
1889	7,983,699	1,195,368
1890	8,407,160	1,393,071

FIBERS OTHER THAN COTTON.

The consumption of raw fibers other than cotton, as reported in the tables of materials, may be treated as unimportant. The use of such material is reported in an exceedingly small number of establishments, and both the quantity and value are too insignificant to be noticed at length. A similar remark may be made as to the yarns of fiber other than cotton, although the use of such materials was rather more important than the consumption of the raw fibers.

YARN PURCHASED.

The items representing amount and cost of cotton yarn not made in the mill where it is finally worked into fabrics, are worthy of more attention. As is well known, the spinning and the weaving industries are almost completely separated in Great Britain, where cotton manufacturing has reached its highest and largest development. In the United States the two industries are usually carried on by the same corporation and under one roof. The census returns do not give countenance to the theory, held by some persons, that a divorce of the two processes is impending. It is true there has been a considerable increase in the number of mills devoted exclusively to spinning, but no such increase appears in the number of weaving mills in which no spinning is done. A critical inspection of the returns shows what can not be exhibited in tabular statements, namely, that the users of yarn not spun by themselves are of three classes: (1) establishments which both spin and weave, but which spin too little for their loom capacity; (2) establishments which purchase fine yarns to be converted into sewing thread; and (3) establishments which weave only. These last are located mostly in the state of Pennsylvania, where a very considerable proportion of all the weaving of intricate and fancy fabrics is done. It will be seen by an examination of the table that Pennsylvania, with 3.10 per cent of the spindles in the country and 4.30 per cent of the looms, consumed 45.25 per cent of all the "yarn not made in mill" reported as material consumed.

OTHER MATERIALS.

The other items entering into the list of materials consumed call for but a single remark. With one exception they are expenditures upon the machinery which drives the mills. The exception is starch, a small amount of which is required to prepare warps for the loom. The weight of starch used in all the cotton mills in the country was but 27,448,792 pounds, while the weight of piece goods produced was 758,903,844 pounds. In other words, the total addition of weight to woven goods by the addition of starch was but 3.62 per cent, and this addition was merely that which is necessary to render the warp threads smooth and to give them the additional strength called for by the strain and wear of weaving.

DUPLICATIONS.

Attention should be directed to one fact relating to the table showing materials used, namely, that there is a certain duplication in some items, to be eliminated if any attempt is made to obtain the net amount and value of materials. It will be evident at a glance that substantially the whole of the "cotton yarn not made in mill" is a duplication as being the product of some of these very mills out of the cotton here reported. The total amount of yarn "not made in mill" is 49,457,669 pounds, valued at $11,363,218. Of this amount a total of 677,954 pounds, valued at $509,682, represents yarns of wool, flax, silk, jute, hemp, and other fibers, spun in other mills, and consumed in the manufacture of goods which are composed so largely of cotton that the makers of them do not class

them even as mixed goods. Although purchased cotton yarns used in weaving mills can not be traced to the spindles from which they came, it is reasonable to assume that most of the quantity coming under this head was the product of American mills and appears under the head of "Yarn" in the table of products. The importation of cotton yarns from abroad during the year ended June 30, 1890, was 1,674,262 pounds, valued at $879,326. What part of this quantity was yarn for doubling and twisting in sewing thread mills which do not spin all their own yarn, and what part of it was used in the weaving of mixed goods, can not be ascertained. The item of waste of other mills is also a duplication in the table of materials, but it calls for no explanation. In the table of products a part of the "yarn" item reappears in woven goods, particularly in upholstery goods, and in sewing cotton, while the rest was transferred to the woolen and silk industries or was consumed in the electrical and other arts. The whole of the item of waste reappears in batting, twine, rope, and "all other products".

PRODUCTS.

WOVEN GOODS.

The products of the cotton mills of the United States may be classified under three heads: woven goods, yarns and thread, and miscellaneous products. The value of woven goods produced by the establishments reporting was $198,741,200, which was 74.16 per cent of the total; of warps, yarn, and sewing thread, $44,885,096, or 16.75 per cent; of all other products, $24,355,428, or 9.09 per cent. An examination of the tables in detail brings out the fact, which experience confirms, that an immense proportion of the goods consumed in the country is coarse and medium fabrics which are most durable and substantial for every-day wear. In the ascertainment of the quantities of the several classes of woven goods manufactured, the square yard was taken as the universal unit for all branches of the textile industry. The product of all the mills was reduced to this uniform standard. The advantage of this rule for statistical purposes is too obvious to require either explanation or argument, and the uselessness of statements showing the number of running yards of fabrics varying from the width of print cloths to that of broad sheetings is equally apparent. First in importance, both in quantity and value, among woven goods are brown and bleached sheetings and shirtings, which amounted to 962,238,062 square yards, valued at $55,193,439, averaging 5.74 cents a square yard in value at the mill. This is not only the most extensive but the most widely distributed branch of the cotton industry, while the goods themselves are those which are in most universal use, and which are adapted to the largest variety of purposes in household economy. The amount of print cloths, classed as "plain cloths for printing or converting" is but slightly below that of sheetings and shirtings, being 955,294,320 square yards; but the value, $43,550,174, is far below that of the leading class. The average value is 4.56 cents a square yard. The largest part, by far, of this product is printed, and becomes the calico of commerce. The census accounts for the printing of 722,257,451 square yards, or 75.61 per cent of the whole; but the goods printed were not drawn exclusively from the fabrics technically classed as print cloths. The relative importance of most of the other classes of woven goods calls for no detailed remarks, particularly as the materials do not exist for a comparison of the amounts produced in former years.

The classification of "fine and fancy woven fabrics" draws attention to the extent to which fine goods are now produced in the country, and gives a means of ascertaining the amount of such goods consumed. We find a total amount of 127,373,179 square yards, valued at $12,545,929, produced in domestic mills, which are thus returned at an average value of 9.85 cents a square yard. Among fine goods should also be classed a small, but not ascertainable, part of the ginghams manufactured in New England and Pennsylvania mills. Neglecting this small item we find that of the 3,002,761,037 square yards of woven goods produced in the country 4.24 per cent only in amount is classed as "fine or fancy woven", while in value these goods represent but 6.31 per cent of the total. During the fiscal year ended June 30, 1890, the entries at the custom houses of the country for consumption (including both direct entries and withdrawn from warehouse) of cotton cloth exceeding 200 threads to the square inch, counting warp and filling, amounted to 10,734,281 square yards, valued at $1,559,889. From the comparative insignificance of these numbers it appears that the proportion of fine woven goods is still less than 5 per cent of the total quantity of cotton cloth consumed and barely 7 per cent of the value. It also appears that while more than nine-tenths of the finer goods consumed are produced in the country, the average foreign value of those imported is fully one-half greater to the square yard than the value at the mill of the goods produced in this country which are classed as fine. This illustrates what experience teaches, that the finest goods used in the United States are still imported from abroad.

The manufacture of upholstery goods, which had a considerable development in the last decade, is chiefly remarkable for its localization. Of the whole value, $2,070,239, of these goods reported for the entire country, Pennsylvania returns all except a value of $162,900, divided between Massachusetts and New York, with a small amount in Wisconsin.

YARN MILLS.

The item of "yarns" has already been partially discussed under the head of materials, that is to say, so far as these yarns have been consumed in other mills classified as cotton, but there has been a large production of yarns which have become the material for other industries. They have been used as warps for worsted dress goods, also by the manufacturers of hosiery and knit goods, in the production of elastic fabrics, and for the covering of electric wires, an industry which has had an enormous development during recent years. The erection of mills for the production of yarn for these collateral uses is the leading feature in the extension of yarn production as a separate industry during the decade under review. It is comparatively easy to trace to their ultimate use most of the yarns which were not woven in the mills where they were produced. The establishments here reported produced 166,397,003 pounds of yarn for sale, and the importation during the year was 1,674,262 pounds, a total of 168,071,265 pounds. Of this amount 48,779,715 pounds were consumed in other cotton mills here reported, 83,624,868 pounds were consumed in woolen and hosiery industries, 4,338,789 pounds in silk industry, and 1,474,514 pounds in elastic fabric factories, an aggregate of 138,217,886 pounds, leaving only 29,853,379 pounds to be accounted for in the electrical and other industries not here mentioned.

SEWING COTTON—HISTORY OF THE INDUSTRY.

One of the most important branches of the cotton manufacture is the manufacture of sewing cotton. The quantity returned during the census year was 13,868,309 pounds, having an aggregate value of $11,637,500. Unfortunately, no trustworthy statistics are in existence showing the amount of production at any former period, except that in the census of 1870 the production of 11,560,241 dozens of spool cotton is reported; but there is no measure of comparison with the quantity now reported. This industry is one which has been established in the country in the face of much discouragement and of repeated failure. A century ago linen fabrics were much more common than fabrics of cotton, and linen thread was the ordinary material for sewing. When cotton thread was first introduced, it was a coarse and inferior article made of ordinary cotton, consisting of three cords twisted together, and was put up in skeins or in balls. There can be no doubt that cotton thread of this class was an early product of American spinning mills, although no record of its manufacture is preserved. The first introduction into this country of cotton thread upon wooden spools was in 1820, when the firm of John Clark, jr., & Co., founded at Glasgow, Scotland, in 1817, established an agency for the sale of such thread in New York. During the next twenty years other Scotch firms entered the market. The thread was of much better quality than that previously in use. It was composed of six strands of yarn, two of which were first twisted together in one direction, and then three of the double strands were twisted in the opposite direction. The result was a thread having much greater stability of twist than was possible for the earlier three-cord variety. Notwithstanding its superiority and the attractive form in which it was put up, which made it at once a favorite in the market, it was a long time before its position was so assured as to induce domestic manufacturers to undertake to produce it. There were several establishments in the United States which, in the years from 1840 to 1850, attempted to twist and spool their own thread for sewing purposes, but their efforts were confined to the production of three-cord thread, inferior in strength and finish, and the imperfections of their merchandise were covered by dyeing them in cheap colors. It was suited to some uses. For sewing thin and open woven fabrics, where the strain upon its strength and upon the stability of its twist was not too great, it answered the purpose. Not long before 1850 the Sagamore Company, of Portsmouth, New Hampshire, undertook to manufacture six-cord thread equal in quality to the standard imported thread, but the skill necessary for carding and spinning sea island cotton had not been attained, nor had the managers a mastery of the difficult and intricate processes of making six-cord thread. The enterprise was a failure and was abandoned. A few years later, about 1855, there was introduced into the country from England a three-cord thread known as a "glacé", or finished thread. Its polished surface, produced by mechanical means, made it really superior to any three-cord thread previously in the market, though still greatly inferior to the six-cord thread. The improvement drew the attention of such of the three-cord spool cotton manufacturers as had survived the discouragement attendant upon their efforts to compete with better goods. The first corporation that engaged in the enterprise of manufacturing glazed thread was the Willington Thread Company, of Willington, Connecticut, a small concern having less than a thousand spinning spindles. This company had already been in the business since 1843 or 1844. The competition of this company was, curiously enough, not with the strong and well made six-cord thread which was sold, but with the cheap and poor thread which was given, or "thrown in", and it finally made a breach in the custom of "throwing in" a spool of cotton with the dress pattern. The process of finishing the thread was patented, and the Willington Company was licensed to make use of it. About this time the Willimantic Linen Company, of Willimantic, Connecticut, which had been engaged in the manufacture of coarse, unbleached linen fabrics and shoe thread, finding the business unsatisfactory, turned its attention to the production of sewing cotton, and secured all the rights under the patent for glazing thread except the rights under license held by the Willington Company. A year or two later the Willimantic Linen Company, which retained and still retains its original name, although it finally ceased the manufacture of linen when it began the manufacture of spool cotton,

purchased the plant of the Willington Thread Company. Before 1860 other finishing processes were invented and put in use by manufacturers in competition with the Willimantic Company. Glazed cotton was manufactured by the firm of Green & Daniels, of Pawtucket, Rhode Island, and by several other concerns of less note at Pawtucket and Fall River. At the time of the beginning of the civil war a substantial industry in this branch of spool cotton had been established. In 1860 Mr. Timothy Merrick, who had been manager of the Willington Mill, and later had been employed by the Willimantic Company, formed a partnership for the manufacture of "satin finish" thread, which subsequently grew into the Merrick Thread Company. The civil war gave a great impetus to the home manufacture of spool thread, both by the greatly increased demand and by the heavy duties laid on the imported article. Another influence was now operating to compel American manufacturers to make a fresh effort in the direction of the production of six-cord thread. The sewing machine had been invented. The three-cord thread of the time was neither strong enough nor in other ways good enough for machine use. The alternative was presented of supplying that which the change in the market demanded or of retiring from business. At the same time the foreign manufacturers who had obtained a reputation in the American market perceived that under the high duties upon manufactures it would be cheaper for them to produce their wares in the United States than to import them. In some cases they began by importing yarn spun in England to be twisted and spooled here; in other cases they introduced spinning at once. The period between 1860 and 1870 was one of not a little discouragement to the purely American manufacturer of six-cord thread. The chief experimenters were, besides the Willimantic Linen Company, the Merrick Thread Company, and the firm of Green & Daniels, already mentioned, the Hadley Company, of Holyoke, Massachusetts, and the Williston Mills, of Easthampton, Massachusetts. Experience shows that the users of sewing cotton are extremely conservative. It is difficult to persuade them to try a new make of thread when they are satisfied with that which they have been using. The obstacles encountered by manufacturers induced the most of them to abandon a hopeless struggle. Nevertheless some of them persevered, but of them all only the Willimantic Linen Company and the Merrick Thread Company succeeded in producing an article equal in all respects to the foreign brands, and finally established a position and a reputation. Meanwhile, three great British makers of thread transferred the production of their supply for the American market to this country. The first such venture was that of the Clark Thread Company, whose mills were erected at Newark, New Jersey and began operation in 1865. A little later the firm of J. & P. Coats, of Paisley, Scotland, established the manufacturing plant at Pawtucket, Rhode Island, known as the Conant Thread Company. Subsequently, in 1883, John Clark, jr., & Co., the first company to introduce six-cord thread into this country, erected the mills of the Clark Mile-end Cotton Company at Kearney, New Jersey. This completes the list of the large manufacturers of sewing cotton operating in the United States before 1890.

STATISTICS FOR 1890.

The following table gives the important facts relating to the sewing thread industry as ascertained at the Eleventh Census:

MANUFACTURE OF SEWING COTTON: 1890.

Number of establishments reporting product	34
Capital	$27,787,196
Product (13,868,309 pounds)	$11,637,500
Number of spindles employed	679,484

EMPLOYÉS AND WAGES.

EMPLOYÉS AND WAGES.	Total.	Men.	Women.	Children.
Average number of employés	9,220	2,105	5,465	850
Total wages	$3,500,516	$1,571,278	$1,787,243	$141,995
Average annual earnings	$379.67	$540.89	$327.03	$167.05
Average weekly earnings (50 weeks in year).	$7.59	$10.82	$6.54	$3.34

PRINCIPAL MATERIALS USED.

KINDS OF COTTON.	Pounds.	Cost.
Total cotton consumed	21,272,349	$4,412,315
Sea island	7,026,334	1,780,186
Other domestic	7,561,910	863,102
Egyptian	4,011,445	654,226
Yarn purchased	2,672,660	1,114,801

An examination of these figures reveals some interesting facts. In the first place, it will be noticed that the average wages paid are much higher than in the cotton industry generally, and higher than those in the geographical divisions where wages are highest. Thus the average weekly wages of men, based on a year of 50 weeks, are $10.82 as compared with $8.68 for all cotton manufactures in the middle states, where the rate is highest. The average of women is $6.54 as compared with $5.76 for all women employed in cotton mills in the same section; and children's wages are $3.34 a week as compared with $3.17 in New England, where children receive the highest rates. Again, it may be observed that nearly all the sea island cotton and nearly two-thirds of the Egyptian consumed in the country are accounted for by the sewing cotton manufacture directly, while most of the remainder of both varieties is no doubt to be traced in the yarn purchased. In this last mentioned category, nevertheless, is to be found a considerable part of the imported yarn. There is a striking difference between the sewing cotton manufacture and the manufacture of cotton generally in the relations between cost of cotton, cost of labor, and value of products. Whereas, as shown on page 167, the cost of cotton represents 43.81 per cent of the value of products, it accounts for only 37.91 per cent of the selling value of spool cotton, although the average cost per pound of the cotton used is much higher than the price of ordinary cotton. This difference is partially accounted for by the large expenditure necessary for preparing the thread for market in attractive form. Labor, also, is not only more highly paid than in ordinary spinning mills, but labor as a whole forms 30.08 per cent of the total selling value of the product as against 25.93 per cent of the value of all cotton products. The difference, however, is not so marked when we compare the percentage of labor cost in sewing thread with the general returns for New England and the middle states, where most of the factories here under examination are located.

DYEING, BLEACHING, AND FINISHING.

The table which gives the facts relative to bleaching, dyeing, and printing cotton goods in spinning and weaving establishments is, in itself, an incomplete exhibit. In order to ascertain what part of the spun and woven product of the country was subjected to bleaching or coloring processes before entering into consumption it is necessary to include the operations of establishments exclusively devoted to these processes with those of establishments which finish their own goods. But the returns as they stand are interesting as showing the absence in this country of the specialization of industries that has been effected abroad. It is well known that in Europe spinning, weaving, bleaching, dyeing, and printing are five separate and distinct industries, any two of which are rarely carried on in the same establishment. While there are to be found in this country establishments in which but one of these industries is carried on, yet, as is remarked elsewhere, the ordinary custom is to combine two or more of them, and there are great corporations, some of the largest in the country, which perform all five of the processes. Indeed, it appears that more than one-fourth of all the dyeing and finishing of cotton goods was performed in mills operating spindles or looms, or both. The general table showing the amount and value of the processes as performed in cotton mills is useful only in completing the exhibits of these mills. The figures themselves furnish the basis for no important conclusions; but in combination with the returns obtained by Special Agent Peter T. Wood, "Dyeing and finishing textiles", they show the form in which goods reached the market.

It appears that there were produced in the United States during the year 955,294,320 square yards of "plain cloths for printing and converting", in other words, of "print cloths". There were printed in cotton mills 142,590,083 square yards, and in printing mills 579,667,368 square yards, a total of 722,257,451 square yards. Of these goods, which were not printed, and of other plain goods, 40,338,722 square yards were dyed in cotton mills, and 446,496,822 square yards were dyed in dyehouses, a total of 486,835,544 square yards of dyed cloth. In cotton mills 65,540,307 square yards and in bleacheries 454,357,758 square yards of cloth were bleached, a total of 519,898,065 square yards. The dyeing of yarn, 90,792,931 pounds in spinning mills and 48,762,759 pounds in dyehouses, 139,555,690 pounds in all, reappears for the most part in the ginghams, ticks, denims, stripes, and upholstery goods, though some of it represents colored sewing thread and yarn consumed in other ways than by weaving. We have this rough statement of the total production of cloth and of the amount bleached, dyed in the piece or the yarn, and printed:

	SQUARE YARDS.
Total production of woven goods	3,002,761,037
Printed	722,257,451
Dyed in the piece	486,835,544
Dyed in the yarn	436,118,141
Bleached	519,898,065
Total finished	2,165,109,201
Entered into consumption "in the gray"	837,651,836

In obtaining the facts relative to finishing processes, both in cotton mills and in separate establishments, the rule was adopted of obtaining the additional value given to goods by subjecting them to these processes. Thus a duplication of material and product, which is inevitable in the case of many manufacturing industries, was avoided, and an error is escaped which stands as a pitfall for the unwary when one attempts to ascertain the percentage of labor cost in a given product.

FINENESS OF GOODS—AVERAGE NUMBER OF YARN.

It is remarked, in that section of this report which refers to the products of manufacture, that by far the largest part of the goods turned out by the cotton mills of the country are the coarse and medium fabrics which are in ordinary use by all classes in the community. The lines between coarse and medium, and between medium and fine goods are, of course, vague and badly defined, but it is generally understood that yarns under No. 20 are coarse, and those over No. 40 are fine. The yarns which are woven into print cloths, of which the calico of commerce is made, are for the most part No. 28 for warps and No. 36 for filling. The best standard sheetings and shirtings are spun from nearly the same numbers. It will thus be seen how large a proportion of the goods in common use are of no higher than medium grade. It may be well to define the meaning attached by manufacturers to the word "number" as applied to yarn. The quantity of yarn is expressed in hanks of 840 yards, and the "number" of the yarn is the number of hanks which weigh a pound troy. (*a*) Thus "No. 20" is yarn of which 20 hanks weigh 1 pound of 5,760 grains. 1 hank weighs 288 grains. A hank of No. 60 weighs 96 grains, or slightly more than one-fifth (0.2194) of an ounce avoirdupois; and it takes 8¾ yards of the same number to weigh 1 grain.

The earliest undertakings in this country, in the spinning of cotton, were for the production of coarse and medium goods, and progress has taken place in the direction both of coarse and of fine goods. The development of such great industries as the manufacture of duck is an example of the growth in one direction. Although in the number of square yards of product duck represents less than 2 per cent (1.84) of the whole amount of woven goods, yet it represents more than 5 per cent of the cotton consumed. The average number of yarn that is woven into duck is less than 10, that is, it is twice as coarse as that in the coarser grades of sheeting and three times as coarse as that in standard sheetings and print cloths. These last mentioned classes of fabrics are themselves an advance in fineness over the early products of American looms. In recent years there has been a marked tendency toward the manufacture of medium fine and very fine yarns and fabrics. Ordinarily each establishment devotes its machinery chiefly or wholly to the production of one general class of goods; that is to say, coarse, medium, or fine, but this rule has many exceptions, and there are a few cases of mills which produce so wide a range of yarns as to include No. 6 and No. 140. A simple average of the fineness of all the yarn spun in a city, a state, or the country, teaches very little that is useful, for the reason that a tendency in the direction of fineness may be wholly obliterated, in such an average, by the existence of a tendency in the other direction also. A large demand for duck at the same time that extensive mills were beginning the production of very fine goods would leave the "average number" substantially unchanged. Nevertheless such returns as have been obtained from the mills do show in a general way that the product of 1890 was yarn of higher counts than that of 1880, but to separate coarse from medium and medium from fine makes the exhibit of more value because less dependent upon an average of things essentially unlike each other.

Two methods of finding the average number of yarn are available. That which was pursued in ascertaining the number as reported by the special agent of the Tenth Census was based upon the spindle as a unit. The method may be best shown by a single example. In mill A there are 30,000 spindles producing yarn for print cloths, average No. 32; in mill B are 20,000 spindles producing yarn for duck, average No. 8; in mill C are 10,000 spindles producing yarn for fine ginghams, average No. 45. We have, then, this calculation:

MILLS.	Spindles.	Number.	Product
Total	60,000	.....	1,570,000
A.....	30,000	32	960,000
B	20,000	8	160,000
C	10,000	45	450,000

1,570,000 ÷ 60,000 = 26⅙, average of the 3 mills.

This method seems faulty for two reasons. In the first place the spindles in one of the mills may be of the most modern pattern, having a speed of 9,000 to 10,000 turns a minute, while another mill may be filled with the antique machinery of the last generation, whose spindles turn not more than 6,000 times a minute and produce only two-thirds as much yarn per spindle as the new. It is obviously a mistake to average quantities which are stated in terms of units having different values. In the second place the average number of the yarn produced by a number of spindles, all of the same pattern and run at the same speed, spinning one-half No. 8 and one-half No. 32, is not No. 20. It is necessary to put more twist into fine yarn than into coarse. Indeed, the number of turns per inch increases rapidly as the fineness of the yarn increases. There is a twofold result of this fact: first, that spindles running on coarse yarn, which requires but a twist of ten turns per inch, can dispose of twice as much roving delivered to them from the rolls as other spindles run at the same speed upon yarn which requires

a The "number" of sewing cotton has the same basis. Before the introduction of six-cord spool thread "No. 40" sewing cotton was the thread made by twisting together 3 strands of "No. 40" yarn. In six-cord thread the yarn used is of double the fineness. Thus the thread to-day sold as No. 40 consists of 6 strands of No. 80 yarn.

twenty turns to the inch; and, second, inasmuch as there is more contraction where the twist is increased, the proportionate length of fine yarn spun is still further reduced. It will thus be seen that the average number as ascertained by the use of the spindle as a unit would be exceedingly misleading, even as between mills equipped with spindles of identical pattern and speed; and if to this confusion we add that which is inevitable when we are obtaining the average of mills using spindles of widely varying capacity, the uselessness of this method becomes evident. Nevertheless, since this was the only method available at the census of 1880, one calculation has been made on this basis for purposes of comparison.

The alternative method adopted for a second calculation of the average number seems certainly to show more accurately what it is required to find, namely, the average number of the yarn produced. In this calculation the unit adopted is the hank, a given length of yarn. This system is also best illustrated by an example: mill D produces 1,000,000 pounds of No. 28 yarn; mill E, 2,000,000 pounds of No. 10 yarn, and mill F 500,000 pounds of No. 50 yarn. We then have:

MILLS.	Pounds of yarn.	Number.	Hanks. (a)
Total	3,500,000	.....	73,000,000
D	1,000,000	28	28,000,000
E	2,000,000	10	20,000,000
F	500,000	50	25,000,000

73,000,000 ÷ 3,500,000 = 20⅞, average number.

a It may be noted that the figures in this column do not, strictly speaking, show the number of hanks since the number of yarn is based upon the troy pound, whereas the yarn is reported in pounds avoirdupois. But the result of the calculation is not in the least affected by this difference.

The column headed "hanks" shows the actual relative lengths of the yarn spun of each of the numbers, and the final division gives the average number of the whole quantity.

Upon an examination of the table wherein are exhibited the average number of yarn as obtained at the Tenth Census and the number as ascertained by both methods at this census, it will be observed that the second method, based upon production of yarn, yields a lower average in the case of almost every state. The exceptions are without significance and need no explanation. What has already been said with reference to the former method of solution will indicate precisely why the average number is always lower by the second process. Spindles producing high counts not only consume less cotton each than those at work upon coarser yarn (this would make no difference in the average if the consumption were inversely proportioned to the number), but they produce less yarn in length, and therefore the true average of two spindles producing No. 10 and the other No. 20 is appreciably below No. 15.

Accepting for what it is worth the ascertainment of the average number using the spindle as a basis, we find that the spinning of 1890 was of greater average fineness in the country as a whole, in each of the geographical divisions, and in most of the states. There is apparently a slight falling off in three of the New England states, but in the case of two of them, Connecticut and Vermont, the appearance is evidently due to the fact that ten years ago the number was stated in integers. The small decline in New Hampshire is probably to be attributed wholly to the large predominance of a single great establishment. The average number is highest in New Jersey a result which is due entirely to the great relative importance of the sewing cotton industry in that state. While the comparative importance of this industry has increased during the last decade, yet the increase has certainly not been as great as appears, for the reason that the average number in 1880 must have been higher than is stated. New Jersey is also the state in which the widest divergence between the two statements of average number is observable, while Rhode Island is the state having a large number of spindles in which the difference is least. The explanation is obvious to those who study the reasons already given for the existence of any difference. In New Jersey, together with much fine spinning there is also not a little coarse spinning. In Rhode Island the range of numbers is smaller. It did not need the figures of the census to prove that there had been an advance in the south in the direction of fine spinning. If the progress seems to be less than might have been supposed, it may be that the method of ascertaining the number does not reveal the whole truth. It will be seen that the true average number in 1890 is higher than the computed number in 1880, which can be said neither of New England nor of the middle states.

While it can be successfully contended that the computation of the average number on the basis of pounds of yarn spun does show precisely what it purports to show, yet there is no doubt a way in which information of a far more useful character might be obtained. It is suggested that the combination of coarse, medium, and fine yarns results in a concealment of what it is really desirable to know, and that it would be well hereafter to divide yarn products into the several classes. The returns at the Eleventh Census show the weight of goods spun in each state of No. 20 yarn and under, of yarn between No. 20 and No. 40, and of yarn above No. 40, and while it is not possible to give the average number of yarn of each class the statement following will be useful for purposes of comparison.

WEIGHT OF SPUN PRODUCT, IN POUNDS

STATES.	No. 20 yarn and below.	Nos. 21 to 40.	Above No. 40.
The United States	480,273,239	386,723,173	34,845,826
New England states	207,672,353	331,611,339	34,800,452
Maine	26,577,650	28,385,603	.....
New Hampshire	54,984,891	36,182,517	.....
Vermont	1,243,508	2,508,883	.....
Massachusetts	103,234,514	186,750,241	18,812,519
Rhode Island	8,280,776	55,640,821	11,116,338
Connecticut	13,351,014	22,143,274	4,871,595
Middle states	62,850,759	40,139,655	45,374
New York	6,553,540	25,529,574	.....
New Jersey	1,456,672	4,631,593	45,374
Pennsylvania	32,215,744	8,023,174	.....
Delaware	2,325,960	1,502,278	.....
Maryland	20,298,843	453,036	.....
Southern states	197,443,432	12,543,916	.....
Virginia	7,719,379	.....	.....
North Carolina	41,972,080	3,076,558	.....
South Carolina	53,275,593	1,244,770	.....
Georgia	52,611,129	6,221,249	.....
Alabama	11,699,255	.....	.....
Mississippi	6,966,959	.....	.....
Kentucky	2,246,776	2,001,339	.....
Tennessee	12,310,343	.....	.....
All other (a)	8,641,918	.....	.....
Western states	12,306,695	2,428,263	.....
Ohio	1,425,000	.....	.....
Indiana	6,649,187	.....	.....
Illinois	950,000	1,424,131	.....
Wisconsin	1,678,474	1,004,132	.....
All other (a)	1,604,034	.....	.....

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments were distributed as follows: southern states—Louisiana, 2; Texas, 1; Arkansas, 2; western states—California, 1; Iowa, 1; Missouri, 1.

In considering the following tables presenting the statistics of cotton manufacture, reference should be made to the text and tables on the combined textile industries that precede this report.

Table 1 presents for the purpose of convenient comparison the statistics relating to cotton manufacture as reported at different census periods. The table comprises all the items of the inquiry common to a number of such periods and the statistics are given for each decennial year from 1840 to 1890, both inclusive.

Table 2 is a statement in detail for 1890 showing each item of the schedule of inquiry, excepting details relating to employés and wages, by totals for the United States, for geographical groups of states, and for each state.

Table 3 is a presentation of employés and wages for the cotton industry considered in its entirety. It shows by totals for each state and for the United States, the average number of men, women, and children distributed into the following classes: (1) officers or firm members actively engaged in the industry or in supervision; (2) clerks; (3) operatives and skilled labor; (4) unskilled labor; (5) pieceworkers. The average number of weeks employed, the average weekly earnings per employé, and the total wages are shown for men, women, and children, in each class, excepting pieceworkers. The statement for pieceworkers gives the average number of men, women, and children, respectively, and the total wages reported for each.

Table 4 shows the average number of men, women, and children, respectively, employed at each weekly rate of pay, by totals for each state, and for the United States.

TABLE 1.—COMPARATIVE STATEMENT FOR THE UNITED STATES, BY

	STATES AND TERRITORIES.	Number of establishments.	Capital. (a)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		
				Aggregates.		Males above 16 years.
				Average number.	Total wages.	
	United States:					
1	1840	1,240	$51,102,359	72,119		
2	1850	1,094	74,500,931	92,286		33,150
3	1860	1,091	98,585,269	122,028	$23,940,108	46,859
4	1870	956	140,706,291	135,369	39,044,132	42,790
5	1880	756	208,280,346	b174,659	42,040,510	61,760
6	1890	905	354,020,843	221,585	69,489,272	91,464
	New England states:					
7	1840	674	34,931,399	46,834		
8	1850	564	53,832,430	61,893		20,745
9	1860	570	69,260,279	81,403	16,720,920	29,886
10	1870	508	100,103,770	94,775	28,740,788	30,203
11	1880	439	156,754,690	127,185	32,170,861	46,897
12	1890	402	243,153,249	148,718	49,908,591	65,057
	Maine:					
13	1840	6	1,398,000	1,414		
14	1850	12	3,329,700	3,739		780
15	1860	19	6,018,325	6,764	1,368,888	1,828
16	1870	23	9,839,685	9,439	2,565,197	2,606
17	1880	24	15,292,078	11,864	2,936,640	3,962
18	1890	23	20,850,754	13,992	4,372,473	5,273
	New Hampshire:					
19	1840	58	5,523,200	6,991		
20	1850	44	10,950,500	12,122		2,911
21	1860	44	12,586,880	12,730	2,883,804	3,829
22	1870	36	13,332,710	12,542	3,989,853	3,752
23	1880	36	19,877,084	16,529	4,290,960	5,235
24	1890	27	26,801,933	19,533	6,429,084	8,290
	Vermont:					
25	1840	7	118,100	262		
26	1850	9	202,500	241		94
27	1860	8	271,200	379	78,468	157
28	1870	8	670,000	451	125,000	125
29	1880	7	936,096	735	161,748	214
30	1890	6	1,431,986	737	220,742	338
	Massachusetts:					
31	1840	278	17,414,099	20,928		
32	1850	213	28,455,630	28,730		9,293
33	1860	217	33,704,674	38,451	7,798,476	13,691
34	1870	191	44,714,375	43,512	13,589,305	13,694
35	1880	175	72,291,601	61,844	15,828,571	22,774
36	1890	187	128,838,837	76,213	26,230,667	33,730
	Rhode Island:					
37	1840	209	7,326,000	12,086		
38	1850	158	6,675,000	10,875		4,959
39	1860	153	10,052,200	14,077	2,847,804	6,353
40	1870	139	18,836,300	16,745	5,224,650	5,583
41	1880	115	28,047,331	21,474	5,320,303	8,344
42	1890	94	38,798,161	24,832	8,131,142	10,761
	Connecticut:					
43	1840	116	3,152,000	5,153		
44	1850	128	4,219,100	6,186		2,708
45	1860	129	6,627,000	9,002	1,743,480	4,028
46	1870	111	12,710,700	12,086	3,246,783	4,443
47	1880	82	20,310,500	14,739	3,632,639	6,368
48	1890	65	26,431,578	13,411	4,524,483	6,665
	Middle states:					
49	1840	298	11,583,882	18,187		
50	1850	352	12,970,445	19,699		8,274
51	1860	340	18,789,069	29,078	5,464,772	12,212
52	1870	274	27,723,306	28,974	7,994,470	8,466
53	1880	139	31,014,759	28,367	6,613,260	9,161
54	1890	239	51,676,249	32,344	10,763,873	12,070
	New York:					
55	1840	117	4,900,772	7,407		
56	1850	86	4,176,920	6,320		2,632
57	1860	79	5,383,479	7,659	1,405,292	3,107
58	1870	81	8,511,326	9,144	2,626,131	2,608
59	1880	36	11,399,638	9,305	1,994,755	3,012
60	1890	42	13,290,745	8,401	2,563,730	3,331
	New Jersey:					
61	1840	43	1,722,810	2,408		
62	1850	21	1,483,500	1,712		616
63	1860	44	1,320,550	2,534	468,336	1,010
64	1870	27	2,762,000	3,514	1,009,351	1,086
65	1880	17	3,807,750	4,222	1,156,961	1,223
66	1890	17	13,519,972	5,683	2,054,282	1,872

a Value of hired property is not included in the capital reported in 1890, because it was not included in the reports of previous census years.

GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.		MACHINERY.		MATERIALS USED.				Value of products.	
Females above 15 years.	Children.	Spindles.	Looms.	Total cost.	Cotton consumed. Bales.	Pounds.	Cost.		
		2,284,631						$46,350,453	1
59,136				$34,835,056	641,240			61,869,184	2
75,169		5,235,727	126,313	57,285,534		422,704,975		115,681,774	3
69,637	22,942	7,132,415	157,310	111,736,936		398,308,257		177,489,739	4
84,558	28,341	10,653,435	225,759	102,206,347	1,570,344	750,343,981	$86,945,725	192,090,110	5
106,689	23,432	14,188,103	324,866	154,912,979	2,261,600	1,117,945,776	117,392,576	267,981,724	6
		1,597,394						31,611,880	7
41,148				23,800,904	430,603			42,040,178	8
51,517		3,858,962	93,344	37,670,782		283,701,306		79,359,900	9
50,805	13,767	5,498,308	114,982	78,816,481		275,625,278		124,959,053	10
62,568	17,720	8,632,087	184,701	74,290,026	1,129,498	541,373,880	63,169,434	143,363,030	11
73,496	10,165	10,836,155	250,116	101,101,446	1,425,958	714,691,714	76,749,130	181,112,453	12
		29,736						970,397	13
2,959				1,573,110	31,531			2,596,356	14
4,936		281,056	6,877	3,319,335		23,733,165		6,235,623	15
6,246	587	459,772	9,902	6,746,780		25,887,771		11,844,181	16
6,481	1,421	695,924	15,971	7,320,152	112,381	54,185,061	6,234,901	13,319,363	17
7,856	863	885,762	21,825	8,446,736	132,504	65,717,252	7,053,168	15,316,909	18
		195,173						4,142,304	19
9,211				4,839,429	83,026			8,830,619	20
8,901		636,788	17,336	7,128,196		51,002,324		13,699,994	21
7,490	1,300	749,843	19,091	12,318,867		41,469,719		16,999,672	22
9,596	1,698	944,053	24,299	10,146,904	157,673	76,386,499	8,629,063	17,953,403	23
10,349	894	1,195,643	31,850	12,962,939	214,034	107,319,124	11,203,742	21,958,002	24
		7,254						113,000	25
147				114,415	2,243			196,100	26
222		17,600	362	181,030		1,447,250		357,450	27
242	84	28,768	628	292,269		1,235,652		546,510	28
350	171	55,081	1,180	508,297	7,404	3,562,068	458,607	855,864	29
309	90	71,591	1,175	542,065	8,954	4,647,889	498,348	914,685	30
		665,095						16,553,423	31
19,437				11,289,309	223,607			19,712,461	32
24,760		1,673,498	42,779	17,214,592		134,012,759		38,004,255	33
24,065	5,753	2,619,541	55,343	37,371,599		130,654,040		59,493,153	34
31,497	7,573	4,236,084	95,321	35,994,109	574,857	278,718,889	31,107,154	72,289,518	35
38,392	4,091	5,824,518	133,227	56,586,283	772,520	386,767,326	40,870,307	100,202,882	36
		518,817						7,116,792	37
5,916				3,484,579	50,713			6,447,120	38
7,724		814,554	17,315	5,799,223		41,614,797		12,151,191	39
8,028	3,134	1,043,242	18,075	13,268,315		44,630,787		22,049,203	40
9,199	3,931	1,764,569	29,669	12,291,437	167,480	81,137,172	10,457,770	22,875,111	41
10,889	3,182	1,924,486	43,106	14,347,672	193,291	97,982,155	11,147,080	27,310,499	42
		181,319						2,715,964	43
3,478				2,500,062	39,483			4,257,522	44
4,974		435,466	8,675	4,028,406		31,891,011		8,911,387	45
4,734	2,909	597,142	11,943	8,818,651		31,747,309		14,026,334	46
5,445	2,926	936,376	18,261	8,029,127	109,703	52,384,171	6,281,939	16,069,771	47
5,701	1,045	934,155	18,933	8,215,751	104,655	52,257,968	5,976,485	15,409,476	48
		487,571						12,222,200	49
11,425				7,349,795	125,392			12,782,718	50
16,866		1,042,480	25,185	13,928,671		87,113,715		26,534,700	51
14,126	6,382	1,246,045	34,974	23,793,595		80,937,966		38,597,765	52
13,188	6,018	1,391,164	27,318	16,191,758	228,729	109,321,428	13,258,526	29,389,286	53
16,253	4,021	1,633,722	25,074	23,044,093	261,154	128,184,288	13,906,748	40,664,476	54
		211,659						3,640,237	55
3,668				1,985,973	37,778			3,591,989	56
4,552		348,584	7,885	3,061,105		23,945,627		6,676,878	57
4,546	1,990	492,573	17,218	6,990,626		24,783,351		11,178,211	58
4,201	2,092	561,658	12,403	4,652,745	64,614	31,656,594	3,981,106	8,266,836	59
4,034	1,036	606,796	13,466	5,564,251	78,824	39,522,057	4,270,665	9,777,295	60
		63,744						2,086,104	61
1,096				666,645	14,437			1,109,524	62
1,524		123,548	1,567	1,165,435		9,094,649		2,217,728	63
1,745	683	200,580	2,176	1,964,758		7,920,035		4,015,768	64
2,291	708	232,221	3,180	2,018,175	21,069	9,950,609	1,319,422	4,548,275	65
3,398	413	374,442	3,673	3,028,933	25,723	12,301,151	1,816,468	5,902,615	66

b Includes 2,115 officers and clerks for whom no wages are reported.

TABLE 1.—COMPARATIVE STATEMENT FOR THE UNITED STATES, BY

	STATES AND TERRITORIES.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		
				Aggregates.		Males above 16 years.
				Average number.	Total wages.	
	Pennsylvania:					
1	1840	106	$3,325,400	5,522		
2	1850	208	4,528,925	7,663		3,564
3	1860	185	9,203,040	14,994	$2,768,340	6,412
4	1870	138	12,550,720	12,730	3,496,986	3,859
5	1880	50	10,311,985	9,957	2,502,688	3,413
6	1890	158	15,884,936	12,960	4,687,088	5,280
	Delaware:					
7	1840	11	330,500	566		
8	1850	12	460,100	838		413
9	1860	11	582,500	1,109	220,224	520
10	1870	6	1,165,000	726	190,069	225
11	1880	8	874,570	797	192,727	243
12	1890	7	1,683,803	987	324,328	282
	Maryland: (a)					
13	1840	21	1,304,400	2,284		
14	1850	24	2,236,000	3,022		1,008
15	1860	20	2,254,500	2,687	582,780	1,093
16	1870	22	2,734,250	2,860	671,933	688
17	1880	19	4,600,816	4,066	766,129	1,270
18	1890	15	7,296,793	4,313	1,134,445	1,305
	District of Columbia: (a)					
19	1840					
20	1850	1	85,000	144		41
21	1860	1	45,000	95	19,800	70
22	1870					
23	1880					
24	1890					
	Southern states:					
25	1840	248	4,331,078	6,642		
26	1850	166	7,256,056	10,043		3,886
27	1860	165	9,840,221	10,152	1,481,704	4,113
28	1870	151	11,088,315	10,175	1,929,779	3,640
29	1880	161	17,375,897	16,741	2,750,986	5,056
30	1890	239	53,827,303	37,168	7,817,069	13,254
	Virginia:					
31	1840	22	1,299,020	1,816		
32	1850	27	1,908,900	2,963		1,275
33	1860	16	1,367,543	1,441	260,856	694
34	1870	11	1,128,000	1,741	229,750	921
35	1880	8	1,190,100	1,112	169,789	301
36	1890	9	2,966,889	2,019	406,824	592
	North Carolina:					
37	1840	25	995,500	1,219		
38	1850	28	1,058,900	1,619		442
39	1860	39	1,272,750	1,755	189,744	440
40	1870	33	1,030,900	1,453	182,951	258
41	1880	49	2,855,800	3,343	439,659	875
42	1890	91	10,775,134	8,742	1,646,196	3,014
	South Carolina:					
43	1840	15	617,450	570		
44	1850	18	857,200	1,019		399
45	1860	17	801,825	891	123,300	342
46	1870	12	1,337,000	1,123	257,680	289
47	1880	14	2,776,100	2,053	380,844	696
48	1890	34	11,141,833	8,192	1,646,574	2,965
	Georgia:					
49	1840	19	573,835	779		
50	1850	35	1,736,156	2,272		873
51	1860	33	2,126,103	2,813	415,332	1,131
52	1870	34	3,433,265	2,846	611,868	1,147
53	1880	40	6,348,657	6,349	1,135,184	1,987
54	1890	53	17,664,675	10,530	2,366,085	4,061
	Florida.					
55	1840					
56	1850	(b)	80,000	95		28
57	1860	1	30,000	65	7,872	40
58	1870					
59	1880	1	11,000	33	5,000	21
60	1890					
	Alabama:					
61	1840	14	35,575	82		
62	1850	12	651,900	715		346
63	1860	14	1,316,000	1,312	198,408	543
64	1870	13	931,000	1,032	216,679	303
65	1880	16	1,246,500	1,490	239,998	426
66	1890	13	2,853,015	2,137	447,173	783

a Maryland and the District of Columbia are classed in this table as in iddle states for purposes of comparison.

GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.		MACHINERY.		MATERIALS USED.				Value of products.	
					Cotton consumed.				
Females above 15 years.	Children.	Spindles.	Looms.	Total cost.	Bales.	Pounds.	Cost.		
		146,494						$5,018,007	1
4,029				$3,152,580	44,162			5,322,262	2
8,582		476,979	12,994	7,386,213		37,496,203		13,650,114	3
6,097	2,774	434,246	12,862	10,724,052		32,953,318		17,490,080	4
4,457	2,087	425,391	8,488	6,105,700	83,997	40,311,809	$4,749,428	11,021,054	5
6,953	1,417	439,638	13,974	10,485,347	92,705	44,629,588	4,371,693	18,431,773	6
		24,492						332,272	7
425				312,068	4,730			538,439	8
589		38,974	986	570,102		3,403,000		941,703	9
286	215	29,534	771	704,783		2,587,615		1,060,898	10
362	192	46,188	822	527,205	7,512	3,236,184	427,855	871,007	11
488	217	53,916	996	587,646	8,876	4,465,825	475,490	1,095,001	12
		41,182						1,150,580	13
2,014				1,165,579	23,325			2,120,564	14
1,594		51,835	1,670	1,698,413		12,880,119		2,973,877	15
1,452	720	89,112	1,947	3,409,426		12,693,647		4,852,808	16
1,877	939	125,706	2,425	2,887,933	51,537	24,166,252	2,780,715	4,682,114	17
2,070	938	158,930	2,965	3,378,016	55,026	27,265,667	2,972,432	5,457,792	18
									19
103				67,000	960			100,000	20
25		2,560	83	47,403		294,117		74,400	21
									22
									23
									24
		180,927						2,241,595	25
6,157				3,332,631	78,140			6,464,488	26
6,039		298,551	6,789	4,954,126		45,786,510		8,460,337	27
4,190	2,343	327,871	6,256	7,419,010		34,351,195		11,372,186	28
7,587	4,098	542,048	11,898	9,999,145	182,349	84,528,757	8,890,408	16,356,596	29
15,989	8,815	1,554,000	36,266	27,764,055	526,856	250,837,646	24,508,776	41,513,711	30
		42,262						446,063	31
1,688				828,375	17,785			1,486,384	32
747		49,440	2,160	811,187		7,544,297		1,489,971	33
507	313	77,116	1,310	937,820		4,255,383		1,435,800	34
530	281	44,340	1,322	640,391	11,461	5,067,519	601,796	1,040,962	35
951	476	94,294	2,517	1,199,578	22,731	10,616,206	1,080,778	1,732,648	36
		47,934						438,900	37
1,177				531,903	13,617			831,342	38
1,315		41,884	761	622,363		5,540,738		1,046,047	39
916	279	39,897	618	963,809		4,238,276		1,345,052	40
1,727	741	92,385	1,790	1,463,645	27,642	11,832,641	1,125,984	2,554,482	41
3,657	2,071	337,786	7,254	6,239,902	114,371	53,546,289	5,396,974	9,563,443	42
		16,355						359,000	43
620				295,971	9,929			748,338	44
549		30,890	525	431,525		3,978,061		713,050	45
508	326	34,940	745	761,469		4,756,823		1,529,937	46
772	585	82,334	1,676	1,808,300	33,624	15,601,005	1,723,187	2,895,769	47
3,075	2,152	332,784	8,546	6,819,320	133,342	64,000,600	6,242,598	9,800,798	48
		42,589						304,342	49
1,399				900,419	20,230			2,135,044	50
1,682		85,186	2,041	1,466,375		13,907,904		2,371,207	51
1,080	619	85,602	1,887	2,504,758		10,921,176		3,648,973	52
2,951	1,411	198,656	4,493	4,019,673	71,389	33,757,199	3,591,554	6,481,894	53
4,009	2,460	445,452	10,459	7,832,230	145,859	69,139,410	6,663,560	12,095,629	54
									55
67				30,000	600			49,920	56
25		1,600	20	23,600		200,000		40,000	57
									58
2	10	816		18,095	350	166,250	16,000	25,000	59
									60
		1,502						17,547	61
369				237,081	5,208			382,260	62
769		35,740	623	617,633		5,246,800		1,040,147	63
445	284	28,046	632	764,965		3,249,523		1,088,767	64
631	433	49,432	863	783,711	14,702	7,271,791	729,202	1,228,019	65
853	501	79,234	1,692	1,459,048	29,962	14,726,454	1,372,058	2,190,771	66

b The number of establishments not given for Florida in 1850.

TABLE 1.—COMPARATIVE STATEMENT FOR THE UNITED STATES, BY

	STATES AND TERRITORIES.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		
				Aggregates.		Males above 16 years.
				Average number.	Total wages.	
	Mississippi:					
1	1840	53	$6,420	81		
2	1850	2	38,000	36		19
3	1860	4	230,000	215	$36,264	106
4	1870	5	751,500	265	61,833	78
5	1880	8	1,122,140	722	133,214	203
6	1890	9	2,053,743	1,184	290,981	480
	Louisiana:					
7	1840	2	22,000	23		
8	1850					
9	1860	2	1,000,000	360	49,440	220
10	1870	4	592,000	246	60,600	123
11	1880	2	195,000	108	12,572	43
12	1890 (a)					
	Texas:					
13	1840					
14	1850					
15	1860	1	450,000	130	15,600	130
16	1870	4	496,000	291	68,211	184
17	1880	2	50,000	71	2,466	45
18	1890 (a)					
	Arkansas:					
19	1840	2	2,125	7		
20	1850	3	16,500	31		13
21	1860	2	37,000	25	4,428	14
22	1870	2	13,000	17	4,100	8
23	1880	2	75,000	64	7,339	20
24	1890 (a)					
	Kentucky:					
25	1840	58	316,113	523		
26	1850	8	239,000	402		181
27	1860	6	244,000	246	41,280	130
28	1870	5	405,000	269	57,951	77
29	1880	3	360,000	352	63,850	128
30	1890	5	1,376,132	834	189,039	284
	Tennessee:					
31	1840	38	463,240	1,542		
32	1850	33	669,600	891		310
33	1860	30	965,000	899	139,180	323
34	1870	28	970,650	890	178,156	252
35	1880	16	1,145,600	1,044	161,071	311
36	1890	20	2,928,657	2,174	495,438	717
	All other southern states:					
37	1890 (a)	5	2,067,225	1,356	328,759	358
	Western states:					
38	1840	20	256,000	456		
39	1850	12	442,000	651		245
40	1860	16	695,700	1,395	272,712	648
41	1870	23	1,790,900	1,447	379,095	481
42	1880	17	3,135,000	2,366	505,403	646
43	1890	25	5,364,042	3,355	999,739	1,083
	Ohio:					
44	1840	8	113,500	246		
45	1850	8	297,000	401		132
46	1860	8	265,000	840	151,164	372
47	1870	7	555,700	462	113,520	216
48	1880	4	670,000	484	104,500	126
49	1890	7	1,213,217	584	193,757	264
	Michigan:					
50	1840					
51	1850					
52	1860					
53	1870					
54	1880	1	20,000	88	16,800	36
55	1890					
	Indiana:					
56	1840	12	142,500	210		
57	1850	2	43,000	93		38
58	1860	2	251,000	367	84,888	177
59	1870	4	551,500	504	113,200	119
60	1880	4	1,090,000	720	162,829	205
61	1890	6	1,744,720	1,325	332,676	341
	Illinois:					
62	1840					
63	1850					
64	1860	3	4,700	11	2,640	10
65	1870	5	151,000	98	25,500	26
66	1880	2	240,000	237	47,885	66
67	1890	4	766,405	454	150,386	135

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 2; Louisiana, 2; Texas, 1.

GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.		MACHINERY.		MATERIALS USED.				Value of products.	
					Cotton consumed.				
Females above 15 years.	Children.	Spindles.	Looms.	Total cost.	Bales.	Pounds.	Cost.		
		318						$1,744	1
17				$21,500	430			30,500	2
109		6,344	90	79,800		698,800		176,328	3
88	99	3,526	152	123,568		580,764		234,445	4
313	206	18,568	644	337,149	6,411	2,881,853	$301,226	679,093	5
398	306	57,004	1,352	871,970	17,366	8,449,834	793,600	1,333,398	6
		706						18,900	7
									8
140		6,725	150	226,600		1,995,700		466,500	9
57	66	13,084	292	161,485		748,525		251,550	10
41	24	6,096	120	72,470	1,358	644,000	68,018	86,776	11
									12
									13
									14
		2,700	100	64,140		588,000		80,695	15
52	55	8,878	235	216,519		1,077,118		374,598	16
10	16	3,648	71	14,827	246	119,986	11,280	21,600	17
									18
		90							19
18				8,975	170			16,637	20
11				11,600		187,500		23,000	21
3	6	1,125		13,780		66,400		22,562	22
17	27	2,015	28	33,305	680	340,000	25,000	50,000	23
									24
		12,358						329,380	25
221				180,907	3,760			273,439	26
116		8,192	76	214,755		1,826,000		315,270	27
71	121	7,734	72	375,048		1,584,625		498,960	28
91	133	9,022	73	253,818	4,050	1,882,234	188,856	418,286	29
372	178	42,942	677	643,949	11,980	5,751,305	554,206	1,000,668	30
		16,813						325,719	31
581				297,500	6,411			510,624	32
576		29,850	243	384,548		4,072,710		698,122	33
463	175	27,923	313	595,789		2,872,582		941,542	34
502	231	35,736	818	553,761	10,436	4,944,279	508,305	874,717	35
1,040	457	97,524	2,043	1,765,162	33,114	15,779,360	1,554,851	2,507,719	36
784	214	66,980	1,726	932,896	18,131	8,828,188	850,156	1,348,637	37
		18,739						274,778	38
406				351,726	7,105			581,800	39
747		35,734	995	731,955		6,103,444		1,326,837	40
516	450	60,191	1,098	1,707,850		7,393,818		2,560,735	41
1,215	505	88,136	1,842	1,725,418	29,768	15,119,916	1,627,357	2,981,196	42
1,841	431	164,226	3,410	3,003,385	47,632	24,232,128	2,227,922	4,691,084	43
		13,754						139,378	44
260				237,060	4,270			394,700	45
468		19,664	540	374,100		3,192,500		723,500	46
147	99	23,240	208	493,704		2,226,400		681,835	47
321	37	13,328	42	286,692	5,323	2,506,182	258,198	637,000	48
313	7	16,560	40	903,446	11,023	5,840,078	383,556	1,468,204	49
									50
									51
									52
									53
38	14	5,100	131	41,000	600	300,000	36,000	70,000	54
									55
		4,985						135,400	56
57				28,220	675			44,200	57
190		11,000	375	229,925		1,813,944		344,350	58
179	206	17,360	448	542,875		2,070,318		778,047	59
391	124	33,396	776	b651,434	11,558	6,364,887	b679,911	1,155,029	60
749	215	74,604	1,649	919,566	16,306	8,240,434	798,178	1,350,425	61
									62
									63
1				11,930		95,000		18,987	64
31	41	1,856	16	177,525		857,000		279,000	65
89	82	4,860	24	142,183	2,261	1,099,130	110,969	219,861	66
281	38	21,800	465	337,773	6,405	3,267,188	312,621	567,988	67

b Owing to error in the published statistics for 1880 the cost of cotton in Indiana is shown to be in excess of the total cost of all materials used.

TABLE 1.—COMPARATIVE STATEMENT FOR THE UNITED STATES, BY

	STATES AND TERRITORIES.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		
				Aggregates.		Males above 16 years.
				Average number.	Total wages.	
	Missouri:					
1	1840					
2	1850	2	$102,000	155		75
3	1860	2	169,000	170	$30,600	85
4	1870	3	489,200	361	120,300	107
5	1880	3	890,000	515	97,680	127
6	1890 (a)					
	Wisconsin:					
7	1840					
8	1850					
9	1860					
10	1870					
11	1880	1	200,000	271	67,209	66
12	1890	4	892,509	501	142,470	209
	Minnesota:					
13	1840					
14	1850					
15	1860					
16	1870					
17	1880	1	5,000	22	6,400	4
18	1890					
	Iowa:					
19	1840					
20	1850					
21	1860					
22	1870	1	1,500	6	275	3
23	1880					
24	1890 (a)					
	Utah:					
25	1840					
26	1850					
27	1860	1	6,000	7	3,420	4
28	1870	3	42,000	16	6,300	10
29	1880	1	20,000	29	2,100	16
30	1890					
	All other western states:					
31	1890 (a)	4	747,191	491	180,450	134

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 1; Iowa, 2; Missouri, 1.

GEOGRAPHICAL DIVISIONS AND STATES AND TERRITORIES: 1840–1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.		MACHINERY.		MATERIALS USED.					
Females above 15 years.	Children.	Spindles.	Looms.	Total cost.	Cotton consumed.			Value of products.	
					Bales.	Pounds.	Cost.		
									1
80				$86,446	2,160			$142,900	2
85		5,000	80	110,000		990,000		230,000	3
154	100	16,715	415	481,745		2,196,600		798,050	4
207	181	19,312	431	376,081	6,399	3,082,132	$336,984	522,980	5
									6
									7
									8
									9
									10
149	56	10,000	400	194,556	3,173	1,541,797	180,072	328,389	11
239	53	32,592	870	382,833	6,924	3,470,388	359,117	620,196	12
									13
									14
									15
									16
12	6	1,708	24	30,000	400	200,000	22,000	40,000	17
									18
									19
									20
									21
3				4,950		20,000		7,000	22
									23
									24
									25
									26
3		70		6,000		12,000		10,000	27
2	4	1,020	11	7,051		23,500		16,803	28
8	5	432	14	3,472	54	25,788	3,223	7,937	29
									30
259	98	18,670	386	459,767	6,974	3,414,040	374,450	638,271	31

TABLE 2.—COTTON MANUFACTURE FOR THE UNITED STATES,

	STATES.	Number of establishments.	CAPITAL.							
			Value of hired property.	Direct investment.						
				Aggregate.	Value of plant.				Live assets.	
					Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.
1	The United States	905	$8,301,464	$354,020,843	$230,993,567	$23,225,097	$69,742,664	$138,025,806	$123,027,276	$37,796,009
2	New England states	402	3,597,474	243,153,249	156,612,532	17,074,774	47,571,383	91,666,375	86,540,717	26,167,666
3	Maine	23	202,633	20,850,754	13,335,358	1,087,916	3,774,087	8,473,355	7,515,396	2,567,137
4	New Hampshire	27	204,616	26,801,933	16,369,652	1,995,018	4,227,222	10,147,412	10,432,281	3,381,604
5	Vermont	6	.....	1,431,986	1,026,200	125,621	332,870	567,709	405,786	122,289
6	Massachusetts	187	1,325,046	128,838,837	80,892,202	9,021,576	24,630,506	47,240,120	47,946,635	15,217,473
7	Rhode Island	94	1,465,110	38,798,161	27,778,643	3,458,746	7,686,756	16,633,141	11,019,518	2,619,568
8	Connecticut	65	400,069	26,431,578	17,210,477	1,385,897	7,219,942	8,604,638	9,221,101	2,259,595
9	Middle states	239	3,957,161	51,676,249	33,011,849	2,580,935	10,124,364	20,306,550	18,664,400	4,100,971
10	New York	42	1,763,700	13,290,745	10,236,876	401,221	3,678,369	6,157,286	3,053,869	1,380,799
11	New Jersey	17	113,160	13,519,972	7,152,467	506,550	2,233,909	4,412,008	6,367,505	896,419
12	Pennsylvania	158	1,973,424	15,884,936	9,248,088	1,057,364	2,526,486	5,664,238	6,636,848	1,409,592
13	Delaware	7	56,877	1,683,803	1,132,118	149,500	221,000	761,618	551,685	66,984
14	Maryland	15	50,000	7,296,793	5,242,300	466,300	1,464,600	3,311,409	2,054,493	347,177
15	Southern states	239	346,769	53,827,303	37,919,840	3,248,968	10,590,952	24,079,920	15,907,463	6,846,102
16	Virginia	9	132,900	2,966,889	2,253,693	194,000	393,953	1,665,740	713,196	164,265
17	North Carolina	91	21,650	10,775,134	8,102,104	696,316	2,030,074	5,375,714	2,673,030	1,083,319
18	South Carolina	34	166,739	11,141,833	7,388,700	298,372	2,129,319	4,961,009	3,753,133	2,462,663
19	Georgia	53	.....	17,664,675	12,003,806	1,455,297	3,724,049	6,824,460	5,660,869	2,041,557
20	Alabama	13	.....	2,853,015	1,852,950	160,450	630,200	1,062,300	1,000,065	464,898
21	Mississippi	9	.....	2,053,743	1,313,020	77,199	342,895	892,926	740,723	186,892
22	Kentucky	5	.....	1,576,132	930,708	71,782	242,707	616,219	445,424	221,552
23	Tennessee	20	17,500	2,928,657	2,221,703	163,197	655,966	1,402,540	706,954	175,907
24	All other southern states (*b*)	5	8,000	2,067,225	1,853,156	132,355	441,789	1,279,012	214,069	45,049
25	Western states	25	400,060	5,364,042	3,449,346	320,420	1,155,965	1,972,961	1,914,696	681,270
26	Ohio	7	382,060	1,213,217	530,394	70,420	283,244	176,730	682,823	218,193
27	Indiana	6	.....	1,744,720	1,158,447	39,500	413,677	705,270	586,273	178,085
28	Illinois	4	.....	766,405	613,483	76,500	225,486	311,497	152,922	47,909
29	Wisconsin	4	.....	892,509	667,022	104,000	103,558	459,464	225,487	134,083
30	All other western states (*b*)	4	18,000	747,191	480,000	30,000	130,000	320,000	267,191	103,000

a Includes officers, firm members, and clerks. For detailed information see Table 3.

BY GEOGRAPHICAL DIVISIONS AND STATES: 1890.

CAPITAL—continued.											
Direct investment—Continued.		MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		
Live assets—Continued.											
Stock in process and finished products on hand.	Cash, bills and accounts receivable, and sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	
$41,388,280	$43,842,987	$16,716,524	$488,735	$2,689,632	$1,213,322	$3,987,748	$4,098,435	$4,238,652	221,585	$69,489,272	1
29,364,303	31,008,748	12,086,430	201,201	2,086,103	701,888	3,173,346	2,730,042	3,193,850	148,718	49,908,591	2
2,187,064	2,761,195	1,185,336	11,920	224,689	74,224	258,108	285,864	330,531	13,992	4,372,473	3
2,710,380	4,340,297	1,340,222	12,277	257,889	85,623	490,999	262,640	230,794	19,533	6,429,084	4
67,017	216,480	59,893	.....	5,795	4,573	5,500	19,480	24,545	737	220,742	5
15,197,131	17,532,031	6,675,285	79,897	1,266,153	355,976	1,864,684	1,552,627	1,555,948	76,213	26,230,667	6
4,985,488	3,414,462	1,871,057	73,090	202,550	102,997	293,473	326,525	872,422	24,832	8,131,142	7
4,217,223	2,744,283	954,637	24,017	129,027	78,495	260,582	282,906	179,610	13,411	4,524,483	8
6,795,321	7,768,108	2,088,631	244,783	262,637	172,456	353,646	544,043	511,066	32,344	10,763,873	9
990,481	682,589	724,405	82,714	126,203	32,074	95,175	138,702	249,537	8,401	2,563,730	10
2,168,512	3,302,574	194,474	6,640	54,282	31,120	45,506	43,734	13,192	5,683	2,054,282	11
2,655,342	2,571,914	730,125	148,012	48,485	75,828	104,154	180,683	172,963	12,960	4,687,088	12
280,583	204,118	85,149	3,417	2,690	6,621	2,799	38,155	31,467	987	324,328	13
700,403	1,006,913	354,478	4,000	30,977	26,813	106,012	142,769	43,907	4,313	1,134,445	14
4,763,444	4,297,917	2,257,660	18,876	315,838	309,329	395,429	752,377	465,811	37,168	7,817,069	15
332,873	216,058	102,565	5,600	11,798	22,670	18,627	40,015	3,855	2,019	406,824	16
736,590	853,121	423,324	1,256	46,567	63,056	93,050	121,097	98,298	8,742	1,646,196	17
766,676	523,794	528,208	10,370	46,049	59,927	59,009	220,076	132,777	8,192	1,646,574	18
1,843,839	1,775,473	724,822	.....	158,296	89,511	119,459	239,508	118,048	10,530	2,366,085	19
238,082	297,085	154,893	.....	14,889	17,215	43,388	27,422	51,979	2,137	447,173	20
286,970	266,861	57,622	.....	6,790	8,693	10,282	19,402	12,455	1,184	290,981	21
117,217	106,655	60,200	.....	4,479	10,784	14,580	11,552	18,805	834	189,039	22
304,921	226,126	173,853	1,050	24,045	21,246	33,702	70,551	23,259	2,174	495,438	23
136,276	32,744	32,173	600	2,925	16,227	3,332	2,754	6,335	1,356	328,759	24
465,212	768,214	283,803	23,875	25,054	20,649	65,327	71,973	67,925	3,355	999,739	25
198,012	266,618	106,399	22,375	6,382	6,548	32,382	19,328	19,384	584	193,757	26
98,796	309,392	73,941	.....	9,500	10,636	9,494	29,164	15,147	1,325	332,676	27
35,288	69,725	18,986	.....	3,306	2,810	6,665	2,280	3,925	454	150,386	28
49,816	41,588	52,477	.....	3,466	4,855	7,986	15,201	20,969	501	142,470	29
83,300	80,891	32,000	1,500	2,400	4,800	8,800	6,000	8,500	491	180,450	30

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Southern states—Arkansas, 2; Louisiana, 2; Texas, 1. Western states—California, 1; Iowa, 2; Missouri, 1.

TABLE 2.—COTTON MANUFACTURE FOR THE UNITED STATES,

	STATES.	Number of establishments.	CAPITAL.							
			Value of hired property.	Direct investment.						
				Aggregate.	Value of plant.				Live assets.	
					Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.
1	The United States	905	$8,301,464	$354,020,843	$230,993,567	$23,225,097	$69,742,664	$138,025,806	$123,027,276	$37,796,009
2	New England states	402	3,597,474	243,153,249	156,612,532	17,074,774	47,571,383	91,666,375	86,540,717	26,167,666
3	Maine	23	202,633	20,850,754	13,335,358	1,087,916	3,774,087	8,473,355	7,515,396	2,567,137
4	New Hampshire	27	204,616	26,801,933	16,369,652	1,995,018	4,227,222	10,147,412	10,432,281	3,381,604
5	Vermont	6	.....	1,431,986	1,026,200	125,621	332,870	567,709	405,786	122,289
6	Massachusetts	187	1,325,046	128,838,837	80,892,202	9,021,576	24,630,506	47,240,120	47,946,635	15,217,473
7	Rhode Island	94	1,465,110	38,798,161	27,778,643	3,458,746	7,686,756	16,633,141	11,019,518	2,619,568
8	Connecticut	65	400,069	26,431,578	17,210,477	1,385,897	7,219,942	8,604,638	9,221,101	2,259,595
9	Middle states	239	3,957,161	51,676,249	33,011,849	2,580,935	10,124,364	20,306,550	18,664,400	4,100,971
10	New York	42	1,763,700	13,290,745	10,236,876	401,221	3,678,369	6,157,286	3,053,869	1,380,799
11	New Jersey	17	113,160	13,519,972	7,152,467	506,550	2,233,909	4,412,008	6,367,505	896,419
12	Pennsylvania	158	1,973,424	15,884,936	9,248,088	1,057,364	2,526,486	5,664,238	6,636,848	1,409,592
13	Delaware	7	56,877	1,683,803	1,132,118	149,500	221,000	761,618	551,685	66,984
14	Maryland	15	50,000	7,296,793	5,242,300	466,300	1,464,600	3,311,400	2,054,493	347,177
15	Southern states	239	346,709	53,827,303	37,919,840	3,248,968	10,590,952	24,079,920	15,907,463	6,846,102
16	Virginia	9	132,900	2,966,889	2,253,693	194,000	393,953	1,665,740	713,196	164,265
17	North Carolina	91	21,650	10,775,134	8,102,104	696,316	2,030,074	5,375,714	2,673,030	1,083,319
18	South Carolina	34	166,739	11,141,833	7,388,700	298,372	2,129,319	4,961,009	3,753,133	2,462,663
19	Georgia	53	.....	17,664,675	12,003,806	1,455,297	3,724,049	6,824,460	5,660,869	2,041,557
20	Alabama	13	.....	2,853,015	1,852,950	160,450	630,200	1,062,300	1,000,065	464,898
21	Mississippi	9	.....	2,053,743	1,313,020	77,199	342,895	892,926	740,723	186,892
22	Kentucky	5	.....	1,576,132	930,708	71,782	242,707	616,219	445,424	221,552
23	Tennessee	20	17,500	2,928,657	2,221,703	163,197	655,966	1,402,540	706,954	175,907
24	All other southern states (*b*)	5	8,000	2,067,225	1,853,156	132,355	441,789	1,279,012	214,069	45,049
25	Western states	25	400,060	5,364,042	3,449,346	320,420	1,155,965	1,972,961	1,914,696	681,270
26	Ohio	7	382,060	1,213,217	530,394	70,420	283,244	176,730	682,823	218,193
27	Indiana	6	.....	1,744,720	1,158,447	39,500	413,677	705,270	586,273	178,085
28	Illinois	4	.....	766,405	613,483	76,500	225,486	311,497	152,922	47,909
29	Wisconsin	4	.....	892,509	667,022	104,000	103,558	459,464	225,487	134,083
30	All other western states (*b*)	4	18,000	747,191	480,000	30,000	130,000	320,000	267,191	103,000

a Includes officers, firm members, and clerks. For detailed information see Table 3.

BY GEOGRAPHICAL DIVISIONS AND STATES: 1890.

CAPITAL—continued.		MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		
Direct investment—Continued.											
Live assets—Continued.											
Stock in process and finished products on hand.	Cash, bills and accounts receivable, and sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Employés.	Wages.	
$41,388,280	$43,842,987	$16,716,524	$488,735	$2,689,632	$1,213,322	$3,987,748	$4,098,435	$4,238,652	221,585	$69,489,272	1
29,364,303	31,008,748	12,086,430	201,201	2,086,103	701,888	3,173,346	2,730,042	3,193,850	148,718	49,908,591	2
2,187,064	2,761,195	1,185,336	11,920	224,689	74,224	258,108	285,864	330,531	13,992	4,372,473	3
2,710,380	4,340,297	1,340,222	12,277	257,889	85,623	490,999	262,640	230,794	19,533	6,429,084	4
67,017	216,480	59,893	.....	5,795	4,573	5,500	19,480	24,545	737	220,742	5
15,197,131	17,532,031	6,675,285	79,897	1,266,153	355,976	1,864,684	1,552,627	1,555,948	76,213	26,230,667	6
4,985,488	3,414,462	1,871,057	73,090	202,550	102,997	293,473	326,525	872,422	24,832	8,131,142	7
4,217,223	2,744,283	954,637	24,017	129,027	78,495	260,582	282,906	179,610	13,411	4,524,483	8
6,795,321	7,768,108	2,088,631	244,783	262,637	172,456	353,646	544,043	511,066	32,344	10,763,873	9
990,481	682,589	724,405	82,714	126,203	32,074	95,175	138,702	249,537	8,401	2,563,730	10
2,168,512	3,302,574	194,474	6,640	54,282	31,120	45,506	43,734	13,192	5,683	2,054,282	11
2,655,342	2,571,914	730,125	148,012	48,485	75,828	104,154	180,683	172,963	12,960	4,087,088	12
280,583	204,118	85,149	3,417	2,690	6,621	2,799	38,155	31,467	987	324,328	13
700,403	1,006,913	354,478	4,000	30,977	26,813	106,012	142,769	43,907	4,313	1,134,445	14
4,703,444	4,297,917	2,257,660	18,876	315,838	309,329	395,429	752,377	465,811	37,168	7,817,069	15
332,873	216,058	102,565	5,600	11,798	22,670	18,627	40,015	3,855	2,019	406,824	16
736,590	853,121	423,324	1,256	46,567	63,056	93,050	121,097	98,298	8,742	1,646,196	17
766,676	523,794	528,208	10,370	46,049	59,927	59,009	220,076	132,777	8,192	1,646,574	18
1,843,839	1,775,473	724,822	.....	158,296	89,511	119,459	239,508	118,048	10,530	2,366,085	19
238,082	297,085	154,893	.....	14,889	17,215	43,388	27,422	51,979	2,137	447,173	20
286,970	266,861	57,622	.....	6,790	8,693	10,282	19,402	12,455	1,184	290,981	21
117,217	106,655	60,200	.....	4,479	10,784	14,580	11,552	18,805	834	189,039	22
304,921	226,126	173,853	1,050	24,045	21,246	33,702	70,551	23,259	2,174	495,438	23
136,276	32,744	32,173	600	2,925	16,227	3,332	2,754	6,335	1,356	328,759	24
465,212	768,214	283,803	23,875	25,054	29,649	65,327	71,973	67,925	3,355	999,739	25
198,012	266,618	106,399	22,375	6,382	6,548	32,382	19,328	19,384	584	193,757	26
98,796	309,392	73,941	.....	9,500	10,636	9,494	29,164	15,147	1,325	332,676	27
35,288	69,725	18,986	.....	3,306	2,810	6,665	2,280	3,925	454	150,386	28
49,816	41,588	52,477	.....	3,466	4,855	7,986	15,201	20,969	501	142,470	29
83,300	80,891	32,000	1,500	2,400	4,800	8,800	6,000	8,500	491	180,450	30

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Southern states—Arkansas, 2; Louisiana, 2; Texas, 1. Western states—California, 1; Iowa, 2; Missouri, 1.

TABLE 2.—COTTON MANUFACTURE FOR THE UNITED STATES,

	STATES.	MACHINERY.								
		Spindles.			Average number of yarn.			Looms.		
		Total.	Mule.	Frame.	Process based upon number of spindles, 1880.	Ascertained by process based upon number of spindles, 1890.	Ascertained by process based upon pounds of spun product, 1890.	Total.	On plain cloths less than 28 inches wide.	On plain cloths 28 to 32 inches wide.
1	The United States.	14,188,103	5,363,486	8,824,617	28.56	29.36	22.93	324,866	23,648	91,862
2	New England states.	10,836,155	4,391,895	6,444,260	30.00	31.31	26.20	250,116	12,609	72,928
3	Maine	885,762	344,697	541,065	24.00	24.77	22.66	21,825	1,219	2,860
4	New Hampshire	1,195,643	364,234	831,409	26.00	24.43	21.14	31,850	243	10,725
5	Vermont	71,591	42,735	28,856	28.00	27.78	25.95	1,175	62	1,113
6	Massachusetts	5,824,518	2,430,719	3,393,799	28.30	30.70	26.75	133,227	6,907	48,717
7	Rhode Island	1,924,486	811,869	1,112,617	36.00	37.96	34.73	43,106	3,690	5,975
8	Connecticut	934,155	397,641	536,514	37.00	36.60	29.91	18,933	488	3,538
9	Middle states	1,633,722	822,613	811,109	25.40	31.51	20.45	35,074	5,196	10,601
10	New York	606,796	334,210	272,586	33.00	31.04	27.69	13,466	404	6,658
11	New Jersey	374,442	304,480	69,962	32.00	54.92	37.14	3,673	502	307
12	Pennsylvania	439,638	175,687	263,951	17.00	19.39	16.65	13,974	3,458	2,648
13	Delaware	53,916	2,880	51,036	20.00	22.22	22.33	996	486	304
14	Maryland	158,930	5,356	153,574	10.00	10.37	9.35	2,965	346	684
15	Southern states	1,554,000	108,474	1,445,526	13.00	15.35	14.76	36,266	5,803	8,309
16	Virginia	94,294	13,198	81,096	16.00	17.42	17.04	2,517	39	160
17	North Carolina	337,786	30,920	306,866	14.00	15.67	15.30	7,254	2,751	3,174
18	South Carolina	332,784	4,000	328,784	11.00	15.50	15.13	8,546	1,215	1,606
19	Georgia	445,452	20,524	424,928	14.00	15.03	14.35	10,459	1,434	1,513
20	Alabama	79,234	9,460	69,774	11.00	13.69	12.67	1,692	252	584
21	Mississippi	57,004	.....	57,004	12.00	14.72	14.58	1,352	.....	432
22	Kentucky	42,942	8,784	34,158	9.00	17.00	15.75	677	.....	160
23	Tennessee	97,524	21,588	75,936	13.00	12.88	12.22	2,043	.....	128
24	All other southern states	66,980	.....	66,980	.....	.....	.....	1,726	112	552
25	Western states	164,226	40,504	123,722	13.60	15.82	15.32	3,410	40	24
26	Ohio	16,560	8,152	8,408	8.00	7.88	7.73	40	40	.....
27	Indiana	74,604	16,320	58,284	15.00	15.46	14.66	1,649	.....	24
28	Illinois	21,800	8,000	13,800	8.00	19.25	17.20	465	.....	.....
29	Wisconsin	32,592	5,622	26,960	19.00	20.11	20.37	870	.....	.....
30	All other western states	18,670	2,400	16,270	.....	.....	.....	386	.....	.....

BY GEOGRAPHICAL DIVISIONS AND STATES: 1890—Continued.

MACHINERY—continued.					MATERIALS USED.						
Looms—Continued.						Cotton.					
On plain cloths 32 to 36 inches wide.	On plain cloths more than 36 inches wide.	On twills, including sateens.	On fancy weaves.	On bags and other special fabrics.	Total cost.	Egyptian, other foreign, and sea island.			Other domestic.		
						Bales.	Pounds.	Cost.	Bales.	Pounds.	Cost.
55,356	71,591	53,726	23,233	5,450	$154,912,979	30,215	14,452,866	$3,054,774	2,231,385	1,103,492,910	$114,337,802
35,063	62,508	46,346	18,900	1,762	101,101,446	20,321	9,899,494	2,065,270	1,405,637	704,792,220	74,683,860
2,989	6,861	4,961	2,469	486	8,446,736				132,504	65,717,252	7,053,168
6,232	3,840	9,770	690	350	12,962,939				214,034	107,319,124	11,203,742
					542,065				8,954	4,647,889	498,348
21,680	26,024	18,895	10,659	345	56,586,283	6,747	3,228,105	663,420	765,773	383,539,221	40,206,887
3,129	18,700	9,481	1,828	303	14,347,672	6,733	3,426,367	700,925	186,558	94,555,788	10,446,155
1,053	7,083	3,239	3,254	278	8,215,751	6,841	3,245,022	700,925	97,814	49,012,946	5,275,560
3,628	5,708	4,930	2,358	2,653	23,044,093	9,894	4,553,372	989,504	251,260	123,630,916	12,917,244
1,396	3,395	1,112	175	326	5,564,251	653	483,368	78,560	78,171	39,038,689	4,192,105
193	393	959	861	458	3,028,933	9,241	4,070,004	910,944	16,482	8,231,147	905,524
1,546	1,350	2,027	1,130	1,815	10,485,247				92,705	44,629,588	4,371,603
	206				587,646				8,876	4,465,825	475,490
493	364	832	192	54	3,378,016				55,026	27,265,667	2,972,432
13,956	2,875	2,442	1,975	906	27,764,055				526,856	250,837,646	24,508,776
1,389	126	236	576		1,199,578				22,731	10,616,206	1,080,773
806	339	73	4	107	6,239,902				114,371	53,546,289	5,396,974
3,826	1,001	898			6,819,320				133,342	64,000,600	6,242,598
3,915	905	717	1,325	650	7,832,230				145,859	69,139,410	6,663,560
684	164			8	1,459,048				29,962	14,726,454	1,372,058
700	40	180			871,970				17,366	8,449,834	793,600
448				69	643,949				11,980	5,751,305	554,206
1,525		258	70	62	1,765,162				33,114	15,779,360	1,554,851
672	300	80		10	932,896				18,131	8,828,188	850,156
2,709	500	8		129	3,003,385				47,632	24,232,128	2,227,922
					903,446				11,023	5,840,078	383,556
1,273	352				919,566				16,306	8,240,434	798,178
440				25	337,773				6,405	3,267,188	312,021
806				4	382,833				6,924	3,470,388	359,117
130	148	8		100	459,767				6,974	3,414,040	374,450

TABLE 2.—COTTON MANUFACTURE FOR THE UNITED STATES

	STATES.	MATERIALS USED—continued.							
		Flax.		Hemp.		Jute.		Yarns not made in mill.	
								Cotton.	
		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
1	The United States	120,540	$14,600	766,931	$41,600	1,443,853	$58,310	48,779,715	$10,853,536
2	New England states					12,000	960	17,928,077	4,562,936
3	Maine							864,321	159,150
4	New Hampshire							193,255	40,560
5	Vermont								
6	Massachusetts							11,247,478	2,785,544
7	Rhode Island					12,000	960	3,333,127	852,122
8	Connecticut							2,289,896	725,560
9	Middle states	120,540	14,600	766,931	41,600	31,853	1,350	26,248,657	5,505,267
10	New York	120,540	14,600	766,931	41,600	31,853	1,350	2,551,113	440,934
11	New Jersey							1,169,600	353,204
12	Pennsylvania							21,822,153	4,651,840
13	Delaware							4,730	868
14	Maryland							701,061	58,421
15	Southern states							3,855,882	635,808
16	Virginia							5,293	821
17	North Carolina							1,938,261	327,102
18	South Carolina							945,482	171,203
19	Georgia							865,000	117,677
20	Alabama							3,000	315
21	Mississippi								
22	Kentucky							69,793	13,261
23	Tennessee							26,053	4,779
24	All other southern states							3,000	650
25	Western states					1,400,000	56,000	747,099	149,525
26	Ohio					200,000	5,000	731,499	146,300
27	Indiana								
28	Illinois								
29	Wisconsin							15,600	3,225
30	All other western states					1,200,000	51,000		

BY GEOGRAPHICAL DIVISIONS AND STATES: 1890—Continued.

MATERIALS USED—continued.

Yarns not made in mill—Continued.

Woolen.		Worsted.		Silk.		Spun silk.		Linen.		
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	
196,874	$131,657	87,257	$62,514	32,851	$154,336	18,583	$83,064	17,722	$9,823	1
14,837	10,313	15,763	7,725	17,337	81,109	1,522	6,346	9,500	5,140	2
										3
										4
										5
7,837	4,563	14,981	6,962	10,302	39,183	892	4,270	4,500	2,140	6
2,000	2,000	782	763	235	1,826	130	576	5,000	3,000	7
5,000	3,750			6,800	40,100	500	1,500			8
179,037	120,544	71,494	54,789	15,514	73,227	17,026	76,618	8,222	4,683	9
96	38	14,494	10,918	1,583	7,237	2,510	8,550	69	27	10
										11
178,941	120,506	57,000	43,871	13,931	65,990	14,516	68,068	8,153	4,656	12
										13
										14
3,000	800					35	100			15
										16
3,000	800									17
										18
										19
						35	100			20
										21
										22
										23
										24
										25
										26
										27
										28
										29
										30

TABLE 2.—COTTON MANUFACTURE FOR THE UNITED STATES,

	STATES.	MATERIALS USED—continued.							
		Yarns not made in mill—Continued.				Waste.		Oil.	
		Jute.		Other yarn.					
		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Gallons.	Cost.
1	The United States.	99,938	$8,976	224,729	$59,312	102,567,306	$4,749,867	1,972,491	$430,393
2	New England states.	33,363	2,383			71,855,604	3,359,429	1,417,740	301,432
3	Maine					4,459,851	309,655	110,024	26,718
4	New Hampshire					64,460	3,550	169,061	28,651
5	Vermont							12,480	1,740
6	Massachusetts	2,800	235			61,488,846	2,732,648	829,712	162,371
7	Rhode Island	563	48			4,804,447	240,390	191,665	57,030
8	Connecticut	30,000	2,100			1,038,000	73,186	104,798	24,922
9	Middle states	66,575	6,593	224,729	59,312	10,049,850	618,415	239,037	59,091
10	New York	5,000	400	3,000	1,350	7,160,374	444,556	53,142	13,780
11	New Jersey					200,476	10,549	62,237	15,392
12	Pennsylvania	61,575	6,193	221,729	57,962	2,689,000	163,310	88,453	21,784
13	Delaware							9,669	2,550
14	Maryland							25,536	5,576
15	Southern states					13,983,544	436,861	292,683	61,794
16	Virginia							12,068	1,757
17	North Carolina					415,604	26,057	84,898	20,050
18	South Carolina					7,200	360	56,038	13,158
19	Georgia					12,255,740	326,644	84,429	15,165
20	Alabama							7,884	1,500
21	Mississippi							9,636	2,665
22	Kentucky					225,000	16,300	10,775	2,428
23	Tennessee					1,080,000	67,500	8,405	1,821
24	All other southern states							18,550	3,250
25	Western states					6,678,308	335,162	23,031	8,076
26	Ohio					5,878,308	285,162	1,149	313
27	Indiana					800,000	50,000	9,578	3,320
28	Illinois							1,744	531
29	Wisconsin							740	187
30	All other western states							9,820	3,725

BY GEOGRAPHICAL DIVISIONS AND STATES: 1890—Continued.

MATERIALS USED—continued.

Starch.		Chemicals and dyestuffs.	Fuel.				Rent of power and heat.	Mill supplies.	All other materials.	
			Total cost.	Coal.	Wood.	Other fuel.				
Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost.	Cost.	Cost.	
27,448,792	$915,644	$4,266,773	$4,252,088	$4,062,958	$137,721	$51,409	$319,611	$4,871,990	$6,236,309	1
20,392,893	706,490	3,278,740	3,113,008	3,054,661	31,658	26,689	182,565	3,475,182	5,256,558	2
2,215,178	81,034	201,962	161,654	160,983	671		39,374	364,048	49,973	3
3,398,612	123,302	711,540	305,150	298,764	6,086	300	24,865	285,011	236,568	4
54,560	1,453		10,394	9,456	938		3,140	25,900	1,090	5
10,963,003	361,419	1,939,579	1,876,222	1,871,088	5,134		93,908	1,735,245	3,971,687	6
2,318,964	84,070	227,336	557,946	548,865	8,681	400	13,638	585,740	573,147	7
1,442,576	57,212	198,323	201,642	165,505	10,148	25,989	7,640	479,238	424,093	8
2,413,935	84,342	427,837	559,256	547,742		11,514	75,198	640,220	704,403	9
687,712	22,522	11,388	117,026	108,928		8,098	9,258	97,486	50,566	10
565,723	22,255	114,665	149,551	149,551			7,175	234,025	305,649	11
777,360	28,778	256,944	203,390	199,974		3,416	35,195	191,987	193,080	12
177,272	4,493	39,397	20,104	20,104			18,670	24,030	2,035	13
205,868	6,294	15,443	69,185	69,185			4,900	92,692	153,073	14
4,122,517	109,510	507,585	515,599	401,280	106,063	8,256	60,698	710,162	216,362	15
265,720	8,342	35,879	17,161	16,761	400		2,344	48,623	3,878	16
545,643	17,851	198,585	100,565	44,821	51,669	4,075	1,550	121,031	29,337	17
807,061	28,654	42,966	111,078	92,695	15,102	3,281	2,500	180,855	25,948	18
1,643,117	30,216	182,406	140,664	125,431	14,333	900	54,204	189,357	112,337	19
108,467	3,048	6,948	23,872	19,740	4,132			51,157	50	20
91,281	2,724	18,000	28,184	16,360	11,824			15,835	10,962	21
174,949	7,129	15,048	8,704	7,504	1,200			18,690	8,183	22
92,688	3,306	7,053	47,525	42,221	5,304		100	53,060	25,167	23
393,591	8,240	700	37,846	35,747	2,099			31,554	500	24
519,447	13,302	42,611	64,225	59,275		4,950	1,150	46,426	58,986	25
114,992	2,643	13,993	9,784	8,234		1,550	500	6,420	49,775	26
265,905	6,678	17,218	22,176	18,776		3,400		16,996	5,000	27
40,950	921	7,500	7,877	7,877				8,323		28
27,600	960		9,496	9,496			650	8,187	1,011	29
70,000	2,100	3,900	14,892	14,892				6,500	3,200	30

TABLE 2.—COTTON MANUFACTURE FOR THE UNITED STATES,

	STATES.	PRODUCTS.							
		Total value.	Plain cloths for printing and converting.		Brown or bleached sheetings or shirtings.		Drills, twills, and sateens.		Ginghams.	
			Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value
1	The United States.	$267,981,724	955,294,320	$43,550,174	962,238,062	$55,193,439	334,020,091	$23,601,239	268,996,715	$20,686,390
2	New England states.	181,112,453	811,945,763	36,811,201	624,467,634	37,784,925	258,208,626	18,475,344	114,092,225	9,975,197
3	Maine	15,316,909	16,810,752	735,065	90,310,254	5,762,028	32,673,054	2,885,938	15,991,962	1,504,041
4	New Hampshire	21,958,002	57,581,153	2,666,926	79,461,338	4,553,793	50,756,073	3,130,379	27,000,000	1,700,000
5	Vermont	914,685	13,852,465	531,613						
6	Massachusetts	100,202,882	610,200,536	27,370,866	279,878,312	16,464,019	104,490,714	7,810,865	63,926,394	6,141,718
7	Rhode Island	27,310,499	76,634,732	3,588,671	141,167,278	8,482,198	46,882,914	3,229,795	4,666,144	418,789
8	Connecticut	15,409,476	36,866,125	1,918,060	43,670,452	2,522,887	23,405,871	1,418,367	2,507,725	210,649
9	Middle states	40,664,476	119,983,537	5,621,564	36,012,784	2,672,270	18,206,659	1,443,168	56,200,311	5,126,992
10	New York	9,777,295	89,881,716	4,369,731	25,906,655	1,976,092	2,195,021	219,502		
11	New Jersey	5,902,615	19,262,856	582,671	57,642	4,035	4,578,842	310,898	5,478,627	444,263
12	Pennsylvania	18,431,773	6,254,018	424,969	6,162,427	538,587	8,419,181	733,063	45,695,919	4,228,069
13	Delaware	1,095,001	2,784,947	118,193					3,489,256	348,926
14	Maryland	5,457,792	1,800,000	126,000	3,886,060	153,556	3,013,615	179,705	1,546,509	105,734
15	Southern states	41,513,711	23,365,020	1,117,409	250,526,060	12,729,063	57,153,833	3,651,159	98,481,246	5,570,157
16	Virginia	1,732,648	512,220	21,558	14,265,103	831,531	5,579,736	302,330		
17	North Carolina	9,563,443	600,000	25,000	16,810,948	894,339	651,849	62,263	56,634,853	3,028,769
18	South Carolina	9,800,798	1,350,000	54,000	89,909,344	4,426,722	32,432,976	2,052,001	8,749,312	546,849
19	Georgia	12,035,629	20,152,800	979,351	54,918,249	2,908,123	11,608,701	785,336	24,386,396	1,312,413
20	Alabama	2,190,771			17,644,120	944,135	1,128,513	66,851	1,000,000	70,000
21	Mississippi	1,333,398			11,162,809	610,269	2,072,519	143,424	2,329,403	291,349
22	Kentucky	1,000,668			9,070,300	392,995				
23	Tennessee	2,507,719	750,000	37,500	14,581,771	719,045	1,992,534	137,734	5,221,282	308,777
24	All other southern states	1,348,637			22,163,416	1,001,904	1,687,005	101,220	160,000	12,000
25	Western states	4,691,084			41,211,584	2,007,181	450,973	31,568	222,933	14,044
26	Ohio	1,468,204								
27	Indiana	1,350,425			18,494,154	854,663	450,973	31,568		
28	Illinois	563,988			6,454,752	315,178				
29	Wisconsin	620,196			10,730,618	570,071				
30	All other western states	688,271			5,532,060	267,269			222,933	14,044

BY GEOGRAPHICAL DIVISIONS AND STATES: 1890—Continued.

PRODUCTS—continued.

Cotton flannels.		Upholstery goods.								Fine or fancy woven fabrics.		Duck.		
		Tapestries.		Curtains.		Chenille.		Other upholstery goods.						
Square yards.	Value.	Square yards.	Value.	Pairs.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	
132. 524. 706	$10. 574. 924	642. 061	$354. 987	676, 032	$1, 225, 364	666. 405	$360, 706	250, 970	$129, 182	127, 373, 179	$12. 545, 929	55, 192, 538	$8, 664, 395	1
110. 106. 513	8. 887, 302							35, 000	45, 000	117, 000, 295	11, 102, 236	16. 979. 346	2, 836, 615	2
6. 145. 611	537, 434									10, 025, 222	1, 256. 471	612. 461	140, 731	3
23. 259. 138	1, 870, 246									3. 008. 380	352. 917	6, 073. 924	692. 224	4
														5
79. 001, 764	6, 319, 622							35. 000	45, 000	59. 061, 558	5. 682, 217	6, 174, 332	1, 101, 367	6
1, 700. 000	160. 000									20. 363, 202	2, 004. 668			7
										24, 541, 933	1, 805. 963	4. 118, 629	902. 293	8
10. 899. 242	949, 761	642, 061	354, 987	675, 932	1, 224, 964	666. 405	360, 706	215. 970	84. 182	9, 968, 640	1. 405, 897	22, 541. 200	4, 190, 527	9
		250, 000	100, 000	3, 500	17, 500					50, 000	20. 000	150, 000	34, 500	10
1. 750. 173	155. 421									449. 358	31. 619	1, 165, 338	254. 917	11
8 810. 063	780, 022	392. 061	254, 987	672, 432	1, 207 464	666, 405	360, 706	215, 970	84. 182	8. 917, 282	1, 243. 878			12
														13
249. 006	14, 318									552, 000	110. 400	21, 225, 862	3, 901, 110	14
11. 608, 951	737, 861									404, 244	37, 796	15, 270, 658	1. 570, 917	15
1. 172. 632	87. 947											1. 421, 120	122. 873	16
7. 731. 783	453, 385									164, 244	13, 796	14, 670	2, 263	17
460. 600	32. 511													18
2. 051. 108	146. 664									240, 000	24, 000	10, 309, 019	967, 799	19
												3, 379. 297	463. 342	20
												1, 000	85	21
														22
192. 828	17. 354													23
												145. 552	14. 555	24
				100	400							401. 334	66. 336	25
														26
														27
														28
				100	400									29
												401, 334	66, 336	30

TABLE 2.—COTTON MANUFACTURE FOR THE UNITED STATES,

	STATES.	PRODUCTS—continued.									
		Ticks, denims, and stripes.		Yarns.		Twine.		Batting or wadding.		Waste.	
		Square yards.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1	The United States	167,121,426	$16,987,546	166,397,003	$33,247,596	8,533,730	$1,364,300	20,470,556	$2,094,232	141,109,597	$5,679,701
2	New England states	130,778,135	13,516,387	62,779,938	15,380,453	2,971,413	532,632	9,631,309	921,331	96,882,997	3,754,271
3	Maine	7,581,001	1,129,811	1,718,659	321,024	314,711	59,835	306,620	26,769	3,741,265	145,368
4	New Hampshire	44,251,519	4,613,278	2,347,271	453,826	.....	.....	50,000	4,000	10,927,461	307,272
5	Vermont	.....	.....	1,607,508	369,812	.....	.....	1,500	135	350,000	13,125
6	Massachusetts	61,192,423	6,118,390	39,770,635	9,858,787	1,595,812	255,091	4,849,500	408,003	68,327,318	2,713,722
7	Rhode Island	900,000	60,000	12,569,683	2,953,458	253,814	64,233	4,173,689	462,424	8,794,229	377,317
8	Connecticut	16,853,192	1,594,908	4,766,182	1,423,546	807,076	153,473	250,000	20,000	4,742,724	197,467
9	Middle states	19,468,275	2,257,953	31,532,884	5,699,441	2,778,867	385,076	1,516,694	166,985	17,345,471	939,814
10	New York	.....	.....	7,289,995	1,468,639	691,785	95,000	1,070,713	115,131	9,124,336	502,624
11	New Jersey	.....	.....	379,949	81,283	7,600	2,280	147,212	17,725	2,312,995	110,720
12	Pennsylvania	16,309,604	1,956,998	21,412,876	3,683,790	.....	.....	298,769	34,129	3,307,740	247,460
13	Delaware	2,669,600	239,997	1,917,646	378,894	.....	.....	.....	.....	100,400	4,010
14	Maryland	489,071	60,958	532,418	86,835	2,079,482	287,796	.....	.....	2,500,000	75,000
15	Southern states	16,875,016	1,213,206	67,752,241	11,311,733	1,787,250	285,649	2,383,961	202,655	20,796,367	656,142
16	Virginia	5,069,000	351,796	.....	.....	.....	.....	1,475	147	185,000	7,400
17	North Carolina	879,990	87,284	25,483,803	4,299,020	999,480	154,777	41,986	3,556	2,008,873	64,817
18	South Carolina	28,987	2,029	15,306,665	2,470,535	66,218	13,557	100	62	3,161,108	117,144
19	Georgia	7,869,707	582,608	16,842,028	2,802,766	174,613	26,352	717,250	51,106	13,291,557	390,420
20	Alabama	2,760,590	173,982	2,062,281	332,560	186,723	30,156	.....	.....	460,344	18,313
21	Mississippi	.....	.....	1,583,623	273,496	.....	.....	77,350	5,816	321,119	8,459
22	Kentucky	.....	.....	1,636,776	350,841	137,055	18,649	115,475	10,725	87,500	3,503
23	Tennessee	266,742	15,507	4,683,815	757,995	223,161	42,158	1,430,325	131,243	930,866	32,964
24	All other southern states	.....	.....	153,250	24,520	.....	.....	.....	.....	350,000	13,125
25	Western states	.....	.....	4,331,940	855,969	996,200	160,943	6,938,592	803,261	6,084,762	329,474
26	Ohio	.....	.....	1,425,000	309,250	.....	.....	4,955,000	590,000	5,330,000	307,954
27	Indiana	.....	.....	1,906,940	373,719	.....	.....	901,350	83,001	354,851	7,474
28	Illinois	.....	.....	950,000	169,000	50,000	10,000	557,242	69,810	.....	.....
29	Wisconsin	.....	.....	.....	.....	31,000	5,271	225,000	29,250	274,911	10,296
30	All other western states	.....	.....	50,000	4,000	915,200	145,672	300,000	31,200	125,000	3,750

a Includes the value of "sewing cotton". This item is not shown separately in order to avoid disclosing the operations of individual establishments. 13,868,309 pounds of sewing cotton were manufactured in the United States during the census year 1890, valued at $11,637,500. Of this amount 9,454,240 pounds, valued at $7,860,189, were manufactured in the New England states; 3,729,722 pounds, valued at $3,585,476, in the middle states; and 684,347 pounds, valued at $191,835, in the southern states.

BY GEOGRAPHICAL DIVISIONS AND STATES: 1890—Continued.

PRODUCTS—continued.							PRINTING, DYEING, AND BLEACHING CLOTH AND YARN IN COTTON MILLS.								
Rope.		All other products. (a)	Weight of piece goods produced.	Weight of yarn spun and purchased.	Weight of products other than piece goods and yarn.	Number of printing machines.	Cloth printed.	Additional gross value given by printing.	Cloth dyed.	Yarn dyed.	Additional gross value given by dyeing.	Cloth bleached.	Yarn bleached.	Additional gross value given by bleaching.	
Pounds.	Value.	Value	Pounds.	Pounds.	Pounds.		Square yards.		Square yards.	Pounds.		Square yards.	Pounds.		
4,580,228	$479,415	$31,242,205	758,903,844	164,184,302	226,919,071	74	142,590,083	$3,217,062	40,338,722	90,792,931	$3,717,532	65,540,307	1,671,434	$531,618	1
75,000	11,250	21,078,309	519,013,355	59,227,770	146,622,828	66	142,590,083	3,217,062	8,494,683	63,193,072	2,502,999	55,207,889	602,286	423,908	2
.....	.....	812,394	53,204,318	1,758,935	8,601,052	2	1,912,009	4,877	2,900,743	8,885,429	312,450	26,340,921	.....	190,797	3
.....	.....	1,613,141	88,820,137	2,347,271	11,271,879	16	24,284,721	339,985	.....	14,908,951	747,339	5,300,000	.....	30,000	4
.....	.....	.....	2,144,883	1,607,508	351,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
.....	.....	9,913,215	276,447,550	35,964,705	97,797,086	44	114,319,877	2,692,950	1,304,064	29,486,218	976,832	22,966,968	.....	168,888	6
.....	.....	5,508,946	62,796,766	12,613,169	20,144,123	3	1,948,476	178,000	2,189,876	3,740,931	250,016	.....	362,286	3,623	7
75,000	11,250	3,230,613	35,599,701	4,936,182	8,457,188	1	125,000	1,250	2,100,000	6,171,543	216,362	600,000	240,000	30,600	8
130,822	17,358	7,762,831	85,279,619	32,387,884	34,717,608	5	.....	.....	30,057,104	8,365,480	605,756	.....	999,948	34,582	9
.....	.....	858,576	25,698,119	7,389,995	13,376,202	5	.....	.....	6,255,000	379,473	13,680	.....	.....	.....	10
.....	.....	3,906,783	6,308,690	379,949	6,086,081	.....	.....	.....	19,762,848	1,778,371	276 419	.....	479,948	21,582	11
.....	.....	2,653,469	31,142,757	22,167,876	10,439,621	.....	.....	.....	.....	5,238,410	262,944	.....	520,000	13,000	12
.....	.....	4,981	1,910,592	1,917,646	100,400	.....	.....	.....	3,489,256	738,004	33,552	.....	.....	.....	13
130,822	17,358	339,022	20,219,461	532,418	4,715,304	.....	.....	.....	550,000	231,222	19,161	.....	.....	.....	14
2,884,406	375,807	2,054,157	144,177,852	68,266,708	29,192,081	3	.....	.....	1,786,935	17,992,439	574,479	10,032,418	69,200	70,128	15
.....	.....	7,066	7,719,379	.....	225,732	.....	.....	.....	.....	1,307,350	32,684	.....	.....	.....	16
279,746	37,218	436,956	20,670,453	25,483,797	4,363,605	.....	.....	.....	1,786,935	5,951,730	208,198	.....	.....	.....	17
.....	.....	85,388	39,883,826	15,306,137	2,481,426	.....	.....	.....	.....	1,487,150	57,750	2,438,468	.....	18,288	18
304,353	84,875	973,816	42,157,349	17,357,029	15,465,209	3	.....	.....	.....	6,970,922	220,482	7,593,950	69,200	51,840	19
365,314	55,235	36,197	9,636,974	2,062,281	1,165,416	.....	.....	.....	.....	450,000	18,000	.....	.....	.....	20
.....	.....	500	5,383,336	1,583,623	398,469	.....	.....	.....	.....	.....	.....	.....	.....	.....	21
650,104	87,764	136,194	2,611,339	1,636,776	1,225,629	.....	.....	.....	.....	1,436,820	17,692	.....	.....	.....	22
534,802	107,844	199,598	7,626,528	4,683,815	3,480,863	.....	.....	.....	.....	363,467	18,173	.....	.....	.....	23
22,667	2,871	178,442	8,488,668	153,250	385,732	.....	.....	.....	.....	25,000	1,500	.....	.....	.....	24
500,000	75,000	346,908	10,433,018	4,301,940	16,386,554	.....	.....	.....	.....	1,241,940	34,298	300,000	.....	3,000	25
.....	.....	261,000	.....	1,425,000	11,235,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	26
.....	.....	.....	4,772,247	1,876,940	1,257,201	.....	.....	.....	.....	891,946	22,298	.....	.....	.....	27
.....	.....	.....	1,424,131	350,000	607,242	.....	.....	.....	.....	200,000	6,000	.....	.....	.....	28
.....	.....	4,908	2,682,606	.....	546,911	.....	.....	.....	.....	.....	.....	.....	.....	.....	29
500,000	75,000	81,000	1,354,034	50,000	2,740,200	.....	.....	.....	.....	150,000	6,000	300,000	.....	3,000	30

TABLE 3.—CLASSIFICATION OF EMPLOYÉS AND WAGES IN COTTON

	STATES.	Number of establishments.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. (a)								
			Aggregates.		Officers or firm members actively engaged in the industry or in supervision.						
					Males above 16 years.				Females above 15 years.			
			Average number.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.
1	The United States	905	221,585	$69,489,272	1,351	48	$34.93	$2,286,461	3	42	$15.34	$1,950
2	Alabama	13	2,137	447,173	27	46	25.18	31,525				
3	Connecticut	65	13,411	4,524,483	98	49	36.26	173,586				
4	Delaware	7	987	324,328	8	50	25.75	10,300				
5	Georgia	53	10,530	2,366,085	96	47	27.31	122,396				
6	Illinois	4	454	150,386	10	50	24.10	12,050				
7	Indiana	6	1,325	332,676	14	49	29.38	20,324				
8	Kentucky	5	834	189,039	12	50	22.37	13,420				
9	Maine	23	13,992	4,372,473	42	49	60.29	123,586				
10	Maryland	15	4,313	1,134,445	24	46	52.85	58,800				
11	Massachusetts	187	76,213	26,230,667	284	49	52.79	736,818	1	44	17.14	750
12	Mississippi	9	1,184	290,981	16	48	24.61	19,100				
13	New Hampshire	27	19,533	6,429,084	34	50	44.93	75,824				
14	New Jersey	17	5,683	2,054,282	20	49	39.79	38,840				
15	New York	42	8,401	2,563,730	48	49	35.10	82,700				
16	North Carolina	91	8,742	1,646,196	135	48	18.59	121,730				
17	Ohio	7	584	193,757	17	49	21.97	18,400				
18	Pennsylvania	158	12,960	4,687,088	182	48	24.22	210,223				
19	Rhode Island	94	24,832	8,131,142	128	49	31.61	196,779				
20	South Carolina	34	8,192	1,646,574	64	48	34.14	105,970				
21	Tennessee	20	2,174	495,438	36	49	21.78	38,185	2	42	14.40	1,200
22	Vermont	6	737	220,742	11	50	26.55	14,604				
23	Virginia	9	2,019	406,824	21	48	26.96	27,181				
24	Wisconsin	4	501	142,470	6	50	21.33	6,400				
25	All other states (b)	9	1,847	509,209	18	46	33.43	27,720				

	STATES.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.									
		Operatives and skilled—Continued.				Unskilled.					
		Children.				Males above 16 years.				Females above 15 years.	
		Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.
26	The United States	22,433	49	$2.65	$2,913,283	5,105	49	$7.69	$1,934,546	88	50
27	Alabama	473	49	1.78	41,496	78	49	4.77	18,290		
28	Connecticut	1,045	49	3.29	168,520	322	50	7.92	126,756		
29	Delaware	217	50	2.65	28,703	21	50	9.28	9,748		
30	Georgia	2,287	48	1.96	213,175	200	47	6.09	57,733		
31	Illinois	38	50	2.47	4,696	6	50	9.00	2,700		
32	Indiana	235	50	2.27	26,544	9	50	7.21	3,245		
33	Kentucky	178	50	1.89	16,857	5	50	5.40	1,350		
34	Maine	705	50	2.88	101,592	303	49	7.98	118,901	15	50
35	Maryland	938	48	2.40	107,442	151	47	7.85	55,792		
36	Massachusetts	3,953	50	3.35	655,504	1,759	49	8.21	713,205	29	50
37	Mississippi	237	48	1.67	19,127	38	47	7.09	12,725		
38	New Hampshire	841	49	3.03	124,997	498	50	8.80	218,318	5	50
39	New Jersey	398	50	2.70	53,819	86	48	10.68	44,342	6	50
40	New York	1,025	50	3.08	157,466	150	50	7.21	53,968	10	50
41	North Carolina	2,038	49	1.84	184,801	219	49	4.71	50,679	2	50
42	Ohio	7	50	1.63	572	8	49	11.82	4,628		
43	Pennsylvania	1,393	48	2.80	188,933	164	49	8.01	64,739	3	50
44	Rhode Island	3,138	50	3.12	486,951	734	50	7.61	276,813		
45	South Carolina	2,103	49	1.93	199,991	214	49	5.00	52,735	1	50
46	Tennessee	319	49	2.30	35,742	71	49	6.10	21,401	17	50
47	Vermont	87	50	2.79	12,133	17	50	7.11	6,041		
48	Virginia	416	46	2.11	40,719	17	49	6.30	5,225		
49	Wisconsin	53	50	1.61	4,264	7	50	9.19	3,215		
50	All other states	309	49	2.61	39,239	28	48	8.91	11,997		

a The average weekly earnings per employé are computed from individual reports. The average number of employés reported by each establishment is multiplied by the number of weeks embraced by the term of operation; the result is the number of weeks required for one employé to perform the labor. Aggregating such results of individual reports the number of weeks required for one employé to perform the labor is obtained. This number used as a divisor for the total wages produces the true average weekly earnings.

MANUFACTURE FOR THE UNITED STATES, BY STATES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Clerks.								Operatives and skilled.								
Males above 16 years.				Females above 15 years.				Males above 16 years.				Females above 15 years.				
Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	
1,276	49	$18.19	$1,140,901	79	50	$9.04	$35,422	80,735	49	$7.75	$30,761,249	95,733	49	$5.53	$26,019,812	1
21	50	11.85	12,340	1	50	8.00	400	630	49	5.31	164,103	793	49	4.19	162,401	2
88	50	24.79	109,010	5	50	9.36	2,341	6,063	49	7.68	2,289,872	5,223	49	5.69	1,453,728	3
8	50	14.21	5,682	.....	.....	.....	.....	239	50	10.41	124,414	484	50	5.91	143,046	4
116	48	13.36	74,189	4	48	12.72	2,464	3,345	47	5.75	907,724	3,458	47	4.55	745,088	5
13	50	21.15	13,750	1	50	12.00	600	106	50	8.14	43,137	280	50	5.25	73,453	6
2	46	21.93	2,010	.....	.....	.....	.....	316	50	7.69	120,483	616	50	4.39	135,170	7
4	50	25.23	5,046	.....	.....	.....	.....	263	50	5.89	77,516	372	50	4.02	74,850	8
38	49	19.12	35,364	.....	.....	.....	.....	4,710	48	7.52	1,714,820	6,589	48	5.68	1,808,700	9
32	47	13.06	19,749	1	50	7.20	360	1,080	48	7.46	387,820	1,968	48	5.12	483,721	10
345	50	20.90	357,097	39	50	9.04	17,637	30,413	50	8.05	12,154,162	34,379	50	5.89	10,024,634	11
14	47	11.97	7,884	.....	.....	.....	.....	368	48	7.09	126,528	265	49	4.66	60,724	12
112	50	19.52	108,998	4	50	10.29	2,058	7,379	50	7.56	2,775,744	10,079	50	5.83	2,919,999	13
24	50	23.47	28,163	7	49	7.60	2,620	1,703	48	10.44	846,715	2,948	48	6.25	892,363	14
37	50	17.96	32,999	.....	.....	.....	.....	2,973	50	7.62	1,129,685	3,646	50	5.28	960,079	15
91	49	10.90	48,234	1	50	6.00	300	2,362	49	5.25	607,637	3,272	49	3.21	513,130	16
12	49	22.37	13,144	1	46	13.09	600	227	49	9.30	103,895	312	48	3.53	52,518	17
107	48	16.87	87,106	5	49	7.09	1,742	4,560	47	9.71	2,094,216	5,521	48	6.42	1,714,418	18
126	50	18.95	118,776	2	50	8.20	820	9,431	50	7.99	3,737,253	9,335	49	5.70	2,631,457	19
52	49	11.10	28,370	5	47	7.33	1,740	2,587	49	5.17	651,706	2,998	49	3.90	567,939	20
11	48	20.83	11,000	1	50	9.60	480	534	49	6.31	165,661	754	49	3.24	118,742	21
2	50	16.00	1,600	.....	.....	.....	.....	303	50	7.53	114,030	304	50	4.50	68,384	22
7	47	15.15	5,650	.....	.....	.....	.....	546	47	6.29	153,236	908	47	3.54	150,677	23
5	50	19.60	4,900	.....	.....	.....	.....	191	50	6.54	62,460	239	50	5.12	61,231	24
5	50	24.60	9,840	2	50	12.60	1,260	436	49	9.76	208,432	1,011	50	4.05	203,360	25

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Unskilled—Continued.								PIECEWORKERS—AVERAGE NUMBER EMPLOYED AND TOTAL WAGES.								
Females above 15 years—Continued.		Children.				Summary.		Males above 16 years.		Females above 15 years.		Children.				
Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.			
$4.37	$19,167	67	50	$2.16	$7,234	14,715	$4,369,247	2,997	$1,101,722	10,786	$3,126,107	932	$141,418	26		
.....	.....	.....	.....	.....	.....	114	16,618	27	5,806	59	9,283	28	1,529	27		
.....	.....	.....	.....	.....	.....	567	200,670	94	34,309	473	166,361	.....	.....	28		
.....	.....	.....	.....	.....	.....	10	2,435	6	1,377	4	1,058	.....	.....	29		
.....	.....	.....	.....	.....	.....	1,024	243,316	304	108,204	547	116,614	173	18,498	30		
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31		
.....	.....	.....	.....	.....	.....	133	24,900	.....	.....	133	24,900	.....	.....	32		
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33		
3.37	2,528	5	50	3.00	750	1,594	466,232	180	66,567	1,261	360,680	153	38,985	34		
.....	.....	.....	.....	.....	.....	119	20,761	18	4,181	101	16,580	.....	.....	35		
5.67	8,447	1	50	3.00	150	5,010	1,562,263	929	345,601	3,944	1,199,736	137	16,926	36		
.....	.....	.....	.....	.....	.....	246	44,893	44	12,585	133	24,658	69	7,650	37		
5.87	1,467	.....	.....	.....	.....	581	201,679	267	112,950	261	75,708	53	13,021	38		
3.94	1,182	3	50	1.89	284	488	145,954	39	27,954	437	116,188	12	1,812	39		
4.27	2,136	.....	.....	.....	.....	512	144,697	123	44,562	378	98,941	11	1,194	40		
2.08	208	.....	.....	.....	.....	622	119,477	207	49,054	382	68,176	33	2,247	41		
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42		
2.21	332	5	50	3.78	944	1,020	324,435	267	121,614	734	199,802	19	3,019	43		
.....	.....	1	50	3.12	156	1,937	682,137	342	126,718	1,552	548,258	43	7,161	44		
4.64	232	16	50	1.85	1,479	164	36,412	48	13,560	83	19,040	33	3,812	45		
3.10	2,635	35	50	1.86	3,255	394	97,137	65	16,210	226	63,101	103	17,826	46		
.....	.....	.....	.....	.....	.....	13	3,950	5	2,050	5	1,750	3	150	47		
.....	.....	.....	.....	.....	.....	133	24,136	30	8,220	43	8,428	60	7,488	48		
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49		
.....	.....	1	50	4.32	216	34	7,145	2	200	30	6,845	2	100	50		

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 2; California, 1; Iowa, 2; Louisiana, 2; Missouri, 1; Texas, 1.

TABLE 3.—CLASSIFICATION OF EMPLOYÉS AND WAGES IN COTTON

	STATES.	Number of establishments.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. (a)									
			Aggregates.		Officers or firm members actively engaged in the industry or in supervision.							
					Males above 16 years.				Females above 15 years.			
			Average number.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.
1	The United States	905	221,585	$69,489,272	1,351	48	$34.93	$2,286,461	3	42	$15.34	$1,950
2	Alabama	13	2,137	447,173	27	46	25.18	31,525				
3	Connecticut	65	13,411	4,524,483	98	49	36.26	173,586				
4	Delaware	7	987	324,328	8	50	25.75	10,300				
5	Georgia	53	10,530	2,366,085	96	47	27.31	122,396				
6	Illinois	4	454	150,386	10	50	24.10	12,050				
7	Indiana	6	1,325	332,676	14	49	29.38	20,324				
8	Kentucky	5	834	189,039	12	50	22.37	13,420				
9	Maine	23	13,992	4,372,473	42	49	60.29	123,586				
10	Maryland	15	4,313	1,134,445	24	46	52.85	58,800				
11	Massachusetts	187	76,213	26,230,667	284	49	52.79	736,818	1	44	17.14	750
12	Mississippi	9	1,184	290,981	16	48	24.61	19,100				
13	New Hampshire	27	19,533	6,429,084	34	50	44.93	75,824				
14	New Jersey	17	5,683	2,054,282	20	49	39.79	38,840				
15	New York	42	8,401	2,563,730	48	49	35.10	82,700				
16	North Carolina	91	8,742	1,646,196	135	48	18.59	121,730				
17	Ohio	7	584	193,757	17	49	21.97	18,400				
18	Pennsylvania	158	12,960	4,687,088	182	48	24.22	210,223				
19	Rhode Island	94	24,832	8,131,142	128	49	31.61	196,779				
20	South Carolina	34	8,192	1,646,574	64	48	34.14	105,970				
21	Tennessee	20	2,174	495,438	36	49	21.78	38,185	2	42	14.40	1,200
22	Vermont	6	737	220,742	11	50	26.55	14,604				
23	Virginia	9	2,019	406,824	21	48	26.96	27,181				
24	Wisconsin	4	501	142,470	6	50	21.33	6,400				
25	All other states (b)	9	1,847	509,209	18	46	33.43	27,720				

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

	STATES.	Operatives and skilled—Continued.				Unskilled.					
		Children.				Males above 16 years.				Females above 15 years.	
		Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.
26	The United States	22,433	49	$2.65	$2,913,283	5,105	49	$7.69	$1,934,546	88	50
27	Alabama	473	49	1.78	41,496	78	49	4.77	18,290		
28	Connecticut	1,045	49	3.29	168,520	322	50	7.92	126,756		
29	Delaware	217	50	2.65	28,703	21	50	9.28	9,748		
30	Georgia	2,287	48	1.96	213,175	200	47	6.09	57,733		
31	Illinois	38	50	2.47	4,696	6	50	9.00	2,700		
32	Indiana	235	50	2.27	26,544	9	50	7.21	3,245		
33	Kentucky	178	50	1.89	16,857	5	50	5.40	1,350		
34	Maine	705	50	2.88	101,592	303	49	7.98	118,901	15	50
35	Maryland	938	48	2.40	107,442	151	47	7.85	55,792		
36	Massachusetts	3,953	50	3.35	655,504	1,759	49	8.21	713,205	29	50
37	Mississippi	237	48	1.67	19,127	38	47	7.09	12,725		
38	New Hampshire	841	49	3.03	124,997	498	50	8.80	218,318	5	50
39	New Jersey	398	50	2.70	53,819	86	48	10.68	44,342	6	50
40	New York	1,025	50	3.08	157,466	150	50	7.21	53,968	10	50
41	North Carolina	2,038	49	1.84	184,801	219	49	4.71	50,679	2	50
42	Ohio	7	50	1.63	572	8	49	11.82	4,628		
43	Pennsylvania	1,393	48	2.80	188,933	164	49	8.01	64,739	3	50
44	Rhode Island	3,138	50	3.12	486,951	734	50	7.61	276,813		
45	South Carolina	2,103	49	1.93	199,991	214	49	5.00	52,735	1	50
46	Tennessee	319	49	2.30	35,742	71	49	6.10	21,401	17	50
47	Vermont	87	50	2.79	12,133	17	50	7.11	6,041		
48	Virginia	416	46	2.11	40,719	17	49	6.30	5,225		
49	Wisconsin	53	50	1.61	4,264	7	50	9.19	3,215		
50	All other states	309	49	2.61	39,239	28	48	8.91	11,997		

a The average weekly earnings per employé are computed from individual reports. The average number of employés reported by each establishment is multiplied by the number of weeks embraced by the term of operation; the result is the number of weeks required for one employé to perform the labor. Aggregating such results of individual reports the number of weeks required for one employé to perform the labor is obtained. This number used as a divisor for the total wages produces the true average weekly earnings.

ANUFACTURE FOR THE UNITED STATES, BY STATES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Clerks.								Operatives and skilled.								
Males above 16 years.				Females above 15 years.				Males above 16 years.				Females above 15 years.				
Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	
276	49	$18.19	$1,140,901	79	50	$9.04	$35,422	80,735	49	$7.75	$30,761,249	95,733	49	$5.53	$26,019,812	1
21	50	11.85	12,340	1	50	8.00	400	630	49	5.31	164,103	793	49	4.19	162,401	2
88	50	24.79	109,010	5	50	9.36	2,341	6,063	49	7.68	2,289,872	5,223	49	5.69	1,453,728	3
8	50	14.21	5,682					239	50	10.41	124,414	484	50	5.91	143,046	4
116	48	13.26	74,189	4	48	12.72	2,464	3,345	47	5.75	907,724	3,458	47	4.55	745,088	5
13	50	21.15	13,750	1	50	12.00	600	106	50	8.14	43,137	280	50	5.25	73,453	6
2	46	21.93	2,010					316	50	7.69	120,483	616	50	4.39	135,170	7
4	50	25.23	5,046					263	50	5.89	77,516	372	50	4.02	74,850	8
38	49	19.12	35,364					4,710	48	7.52	1,714,820	6,589	48	5.68	1,808,700	9
32	47	13.06	19,749	1	50	7.20	360	1,080	48	7.46	387,820	1,968	48	5.12	483,721	10
345	50	20.90	357,097	39	50	9.04	17,637	30,413	50	8.05	12,154,162	34,379	50	5.89	10,024,634	11
14	47	11.97	7,884					368	48	7.09	126,528	265	49	4.66	60,724	12
112	50	19.52	108,998	4	50	10.29	2,058	7,379	50	7.56	2,775,744	10,079	50	5.83	2,919,999	13
24	50	23.47	28,163	7	49	7.60	2,620	1,703	48	10.44	846,715	2,948	48	6.25	892,363	14
37	50	17.96	32,999					2,973	50	7.62	1,129,685	3,646	50	5.28	960,079	15
91	49	10.90	48,234	1	50	6.00	300	2,362	49	5.25	607,637	3,272	49	3.21	513,130	16
13	49	22.37	13,144	1	46	13.09	600	227	49	9.30	103,895	312	48	3.53	52,518	17
197	48	16.87	87,106	5	49	7.09	1,742	4,560	47	9.71	2,094,216	5,521	48	6.42	1,714,418	18
126	50	18.95	118,776	2	50	8.20	820	9,431	50	7.99	3,737,253	9,335	49	5.70	2,631,457	19
52	49	11.10	28,370	5	47	7.33	1,740	2,587	49	5.17	651,706	2,986	49	3.90	567,939	20
11	48	20.83	11,000	1	50	9.60	480	534	49	6.31	165,661	754	49	3.24	118,742	21
2	50	16.00	1,600					303	50	7.53	114,030	304	50	4.50	68,384	22
7	47	15.15	5,650					546	47	6.29	153,236	908	47	3.54	150,677	23
5	50	19.60	4,900					191	50	6.54	62,460	239	50	5.12	61,231	24
1	50	24.60	9,840	2	50	12.60	1,260	436	49	9.76	208,432	1,011	50	4.05	203,360	25

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Unskilled—Continued.						PIECEWORKERS—AVERAGE NUMBER EMPLOYED AND TOTAL WAGES.							
Females above 15 years—Continued.		Children.				Summary.		Males above 16 years.		Females above 15 years.		Children.	
Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
$4.37	$19,167	67	50	$2.16	$7,234	14,715	$4,369,247	2,997	$1,101,722	10,786	$3,126,107	932	$141,418
						114	16,618	27	5,806	59	9,283	28	1,529
						567	200,670	94	34,309	473	166,361		
						10	2,435	6	1,377	4	1,058		
						1,024	243,316	304	108,204	547	116,614	173	18,498
						133	24,900			133	24,900		
3.37	2,528	5	50	3.00	750	1,594	466,232	180	66,567	1,261	360,680	153	38,985
						119	20,761	18	4,181	101	16,580		
5.87	8,447	1	50	3.00	150	5,010	1,562,263	929	345,601	3,944	1,199,736	137	16,926
						246	44,893	44	12,585	133	24,658	69	7,650
5.87	1,467					581	201,679	267	112,950	261	75,708	53	13,021
3.94	1,182	3	50	1.89	284	488	145,954	39	27,954	437	116,188	12	1,812
4.27	2,136					512	144,697	123	44,562	378	98,941	11	1,194
2.08	208					622	119,477	207	49,054	382	68,176	33	2,247
2.21	332	5	50	3.78	944	1,020	324,435	267	121,614	734	199,802	19	
		1	50	3.12	156	1,937	682,137	342	126,718	1,552	548,258	43	
4.64	232	16	50	1.85	1,479	164	36,472	48	13,560	83	19,040	33	
3.10	2,635	35	50	1.86	3,255	394	97,137	65	16,210	226	63,101	102	
						13	3,950	5	2,050	5	1,750	3	
						133	24,136	30	8,220	43	8,428	60	
		1	50	4.32	216	34	7,145	2	200	30	6,845	2	

[a] Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These are distributed as follows: Arkansas, 2; California, 1; Iowa, 2; Louisiana, 2; Missouri, 1; Texas, 1.

TABLE 4.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY IN COTTON MANUFACTURE FOR THE UNITED STATES, BY STATES: 1890.

STATES.	Number of establishments.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)									
		Aggregates.		Males above 16 years.							
		Average number.	Total wages.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.
The United States	905	221,585	$69,489,272	88,467	15,164	9,924	15,491	10,485	9,120	8,712	8,409
Alabama	13	2,137	447,173	756	377	108	76	58	38	42	11
Connecticut	65	13,411	4,524,483	6,571	906	673	1,401	973	678	622	541
Delaware	7	987	324,328	276	14	14	23	15	15	59	40
Georgia	53	10,530	2,366,085	3,757	1,653	640	641	189	97	126	99
Illinois	4	454	150,386	135	24	7	6	4	12	18	29
Indiana	6	1,325	332,676	341	19	95	78	24	35	17	13
Kentucky	5	834	189,039	284	120	69	11	10	7	42	4
Maine	23	13,992	4,372,473	5,093	704	555	1,340	578	375	516	524
Maryland	15	4,313	1,134,445	1,287	231	225	100	141	122	129	161
Massachusetts	187	76,213	26,230,667	32,801	4,252	3,061	5,779	4,354	3,790	3,938	3,711
Mississippi	9	1,184	290,981	436	93	53	80	50	28	40	25
New Hampshire	27	19,533	6,429,084	8,023	951	1,246	1,385	1,108	750	876	876
New Jersey	17	5,683	2,054,282	1,833	163	65	289	111	354	121	185
New York	42	8,401	2,563,730	3,208	691	552	460	420	156	224	291
North Carolina	91	8,742	1,646,196	2,807	1,333	439	446	145	71	74	59
Ohio	7	584	193,757	264	27	9	17	24	41	20	60
Pennsylvania	158	12,960	4,687,088	5,013	396	331	693	528	447	598	637
Rhode Island	94	24,832	8,131,142	10,419	1,132	876	1,937	1,452	1,877	998	1,000
South Carolina	34	8,192	1,646,574	2,917	1,536	509	360	136	59	76	64
Tennessee	20	2,174	495,438	652	248	55	109	45	26	92	8
Vermont	6	737	220,742	333	52	47	70	50	25	22	26
Virginia	9	2,019	406,824	562	151	176	81	44	18	21	21
Wisconsin	4	501	142,470	209	56	53	28	6	13	11	13
All other states (b)	9	1,847	509,209	490	35	66	81	20	86	30	11

STATES.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.									
	Males above 16 years—Continued.				Females above 15 years.					
	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.
The United States	5,427	3,027	1,291	1,417	95,903	32,090	20,823	21,731	11,324	5,633	2,810
Alabama	11	5	13	17	794	532	203	42	11	6	
Connecticut	369	205	84	119	5,228	1,313	1,262	1,480	750	299	103
Delaware	65	16	6	9	484	106	116	135	58	34	35
Georgia	76	102	66	68	3,462	2,059	599	434	308	48	9
Illinois	1	13	8	13	281	60	149	39	11	16	5
Indiana	26	15	8	11	616	431	126	48	8	3	
Kentucky	5	6	4	6	372	292	50	4	9	7	2
Maine	253	109	82	57	6,595	1,666	1,693	1,929	752	244	185
Maryland	85	57	16	20	1,969	1,006	362	376	116	103	6
Massachusetts	2,204	843	339	530	34,448	9,418	6,987	8,427	4,643	2,865	1,512
Mississippi	31	22	11	3	265	108	102	52	3		
New Hampshire	459	171	113	88	10,088	2,197	2,979	2,468	1,134	642	368
New Jersey	214	254	42	35	2,961	578	610	718	831	181	34
New York	207	121	40	46	3,656	1,156	947	1,178	281	62	20
North Carolina	70	82	52	36	3,275	2,849	294	111	18	3	
Ohio	9	32	9	16	313	281	27		4		
Pennsylvania	626	489	142	126	5,529	1,348	1,103	1,153	899	401	335
Rhode Island	513	362	151	121	9,337	2,170	2,030	2,849	1,399	615	168
South Carolina	53	43	37	44	2,992	2,136	692	136	18	6	4
Tennessee	17	18	23	11	774	658	70	36	7		1
Vermont	17	13	3	8	304	171	73	31	21	3	1
Virginia	13	12	15	10	908	853	40	15			
Wisconsin	14	8	7		239	69	81	43	10	35	1
All other states	89	29	20	23	1,013	633	228	27	33	60	21

a In comparing the table of weekly rates and the average number of employés at each rate with the average weekly earnings presented in Table 3, it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés employed at the respective rates.

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 2; California, 1; Iowa, 2; Louisiana, 2; Missouri, 1; Texas, 1.

TABLE 8.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY IN COTTON MANUFACTURE FOR THE UNITED STATES, BY STATES: 1890—Continued.

STATES.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.									PIECEWORKERS.	
	Females above 15 years—Continued.				Children.						
	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	Average number.	Total wages.
The United States	1,152	282	34	24	22,500	21,798	684	15	3	14,715	$4,369,247
Alabama					473	473				114	16,618
Connecticut	14	5	2		1,045	1,032	12		1	567	200,670
Delaware					217	216	1			10	2,435
Georgia		3	2		2,287	2,234	50	3		1,024	243,316
Illinois		1			38	38					
Indiana					235	235				133	24,900
Kentucky	4		4		178	178					
Maine	121	5			710	710				1,594	466,232
Maryland					938	938				119	20,761
Massachusetts	528	53	11	4	3,954	3,655	293	6		5,010	1,562,263
Mississippi					237	237				246	44,893
New Hampshire	280	20			841	822	19			581	201,679
New Jersey	4	1	4		401	394	7			488	145,954
New York	9	3			1,025	876	149			512	144,697
North Carolina					2,038	2,008	25	5		622	119,477
Ohio		1			7	7					
Pennsylvania	93	167	10	20	1,398	1,324	74			1,020	324,435
Rhode Island	85	21			3,139	3,093	44	1	1	1,937	682,137
South Carolina					2,119	2,108	10		1	164	36,412
Tennessee		2			354	354				394	97,137
Vermont	4				87	87				13	3,950
Virginia					416	416				133	24,136
Wisconsin					53	53					
All other states	10		1		310	310				34	7,145

SILK MANUFACTURE.

BY BYRON ROSE.

The very full and comprehensive report prepared by the late William C. Wyckoff, special agent in charge of the inquiry into the manufacture of silk and silk goods at the Tenth Census, which report covered the entire period from the earliest introduction of silk on the American continent to the decennial period of 1880, precludes the necessity in this report for any extended reference to the rise and progress of silk manufacture in the United States beyond such as may be necessary for purposes of comparison.

PRODUCTION.

The growth of the silk industry during the past decade, both in quantity and value of production, may justly be considered as one of leading interest. The value of finished products of silk manufacture in 1890 was $69,154,599, an increase in value over that of 1880 of $34,634,876, or 100.33 per cent. Table 1 exhibits the leading general facts regarding silk manufacture for the census years 1890 and 1880, showing by each state and for the United States the number of establishments, amount of capital, statistics of machinery, miscellaneous expenses, average number of employés and their wages, cost of materials used, and value of products.

TABLE 1.—COMPARATIVE STATEMENT FOR THE UNITED STATES, BY STATES: 1890 AND 1880.

STATES.	Years.	Number of establishments.	CAPITAL. Total. (a)	Value of land and buildings.	Value of machinery, tools, and implements.	Live assets. (b)	Miscellaneous expenses. (c)	MACHINERY. Looms. Hand. On broad goods.	Hand. On narrow goods.	Power. On broad goods.	Power. On ribbons.	Power. On other narrow goods.
The United States	1890	472	$51,007,537	$6,904,628	$14,181,680	$29,921,229	$4,259,623	413	1,334	14,866	4,389	1,567
	1880	382	19,125,300	3,836,600	5,227,500	10,061,200	.....	1,629	1,524	3,103	(d)	(d)
California	1890	4	112,283	.....	30,409	81,874	10,438	.....	35	.....	1	.....
	1880	5	164,300	16,400	62,000	85,900	.....	.....	24	.....	.....	.....
Connecticut	1890	35	9,037,042	1,295,789	1,617,538	6,123,715	270,426	6	.....	1,053	290	29
	1880	28	4,436,500	746,000	1,247,550	2,442,950	.....	2	10	448	.....	.....
Illinois	1890	10	422,096	93,000	106,200	222,896	35,761	.....	82	.....	.....	44
	1880	5	82,000	25,000	30,000	27,000	.....	.....	51	.....	.....	.....
Maryland	1890	4	50,400	7,500	12,400	30,500	3,798	.....	.....	.....	14	.....
	1880	4	20,900	3,500	10,000	7,400	.....	.....	39	.....	.....	.....
Massachusetts	1890	20	3,353,296	364,800	591,908	2,396,588	484,390	41	55	354	.....	90
	1880	22	1,306,900	194,100	303,950	808,850	.....	62	91	.....	.....	.....
New Jersey	1890	132	16,809,927	2,170,079	5,039,564	9,600,284	1,356,137	218	19	9,146	2,112	229
	1880	106	6,952,325	984,100	2,290,000	3,678,225	.....	1,444	153	2,017	.....	.....
New York	1890	185	11,165,916	1,376,242	3,612,758	6,176,918	1,123,671	80	972	1,838	1,478	572
	1880	151	4,696,775	1,433,000	966,000	2,297,775	.....	85	906	543	.....	.....
Ohio	1890	3	37,830	15,000	1,750	21,080	2,662	8	8	.....	.....	.....
	1880	6	24,700	4,000	12,000	8,700	.....	.....	22	.....	.....	.....
Pennsylvania	1890	66	9,362,063	1,462,502	2,941,679	4,957,882	939,051	60	163	2,306	451	608
	1880	49	1,379,900	422,000	287,000	670,900	.....	36	226	95	.....	.....
Rhode Island	1890	3	122,256	.....	70,364	51,892	17,427	.....	.....	.....	43	.....
	(e) 1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other states	(f) 1890	5	534,426	119,716	157,110	257,600	15,862	.....	.....	169	.....	.....
	(g) 1880	6	61,000	8,500	19,000	33,500	.....	.....	2	.....	.....	.....

a Value of hired property is not included in the capital reported in 1890, because it was not included in the report of 1880.

b This item was not fully reported in 1880.

c Items under this head were not reported in 1880.

d Not separately reported in 1880.

e Included in group "All other states, 1880".

f Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maine, 1; Michigan, 1; Missouri, 1; North Carolina, 1; Virginia 1.

g Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Kansas, 1; Maine, 1; Missouri, 1; New Hampshire, 1; Rhode Island, 1; Vermont, 1.

TABLE 1.—COMPARATIVE STATEMENT FOR THE UNITED STATES, BY STATES: 1890 AND 1880—Continued.

STATES.	Years.	MACHINERY—continued. Power looms—Continued. Total on ribbons and other narrow goods.	Spindles. Winding, cleaning, and doubling.	Spindles. Spinning and twisting.	Spindles. Braiding.	AVERAGE NUMBER OF EMPLOYES AND TOTAL WAGES. Aggregates. Average number.	Total wages.	Males above 16 years.	Females above 15 years.	Children.	COST OF MATERIALS USED. Raw silk and silk materials.	Other textile materials.
The United States	1890	5,956	369,035	718,360	167,403	50,913	$19,680,318	18,998	29,049	2,866	$46,351,200	$2,327,684
	1880	2,218	164,218	262,312	81,607	31,337	9,146,705	9,375	16,396	5,566	19,208,683	1,400,480
California	1890	1	799	2,018	29	214	83,566	56	156	2	123,406	13,303
	1880	.....	200	150	754	151	41,400	20	106	25	66,418	3,500
Connecticut	1890	319	45,402	84,262	11,492	5,081	2,006,804	1,649	3,309	123	5,723,328	78,485
	1880	155	35,353	53,472	.....	3,428	1,026,530	785	1,990	653	3,025,325	12,000
Illinois	1890	44	363	369	221	805	295,636	198	597	10	155,931	111,978
	1880	13	.....	.....	.....	259	72,195	67	135	57	73,820	9,500
Maryland	1890	14	6	.....	.....	75	24,233	31	44	.....	29,530	2,799
	1880	.....	.....	.....	.....	82	11,000	12	56	14	11,630	2,980
Massachusetts	1890	90	26,235	55,200	30,403	3,216	1,296,399	1,192	1,936	88	2,861,697	156,120
	1880	88	13,514	16,936	11,000	1,826	521,725	353	1,285	188	1,730,870	161,815
New Jersey	1890	2,341	135,160	224,204	19,366	17,917	7,176,180	8,184	8,834	899	17,191,845	228,811
	1880	939	76,037	134,746	33,429	12,549	4,177,745	4,696	5,360	2,493	8,664,835	83,400
New York	1890	2,050	62,197	92,772	72,635	13,151	5,584,399	4,857	8,014	280	8,571,281	936,248
	1880	552	27,707	39,564	22,784	9,633	2,590,025	2,405	5,459	1,769	4,333,485	730,530
Ohio	1890	.....	96	.....	.....	40	13,685	10	30	.....	8,335	5,488
	1880	.....	.....	.....	.....	125	12,550	21	73	41	14,845	2,075
Pennsylvania	1890	1,054	89,429	228,786	30,217	9,522	2,981,334	2,604	5,625	1,293	10,875,625	794,350
	1880	471	9,497	15,744	6,864	3,189	678,120	1,000	1,870	319	1,207,795	394,680
Rhode Island	1890	43	930	2,463	40	194	61,978	55	109	30	147,015	.....
	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other states	1890	.....	8,418	28,286	3,000	698	156,104	162	395	141	663,207	102
	1880	.....	1,910	1,700	6,776	85	15,415	16	62	7	79,660	.....

STATES.	Years.	COST OF MATERIALS USED—continued. Dyestuffs, chemicals, oil, and soap.	Fuel.	Rent of power and heat.	All other materials.	Gross cost of materials.	Silk material twice included.	Cost of net materials. (a)	VALUE OF PRODUCTS. Gross value of products	Silk product twice included.	Value of net products. (a)
The United States	1890	$717,111	$400,107	$85,409	$1,122,914	$51,004,425	$15,537,520	$35,466,905	$87,298,454	$18,143,855	$69,154,599
	1880	828,314	173,283	.....	856,941	22,467,701	3,898,535	18,569,166	41,033,045	6,513,322	34,519,723
California	1890	458	102	1,734	7,403	146,406	3,500	142,906	271,912	5,600	266,312
	1880	3,552	2,355	.....	5,170	80,995	14,595	66,400	159,175	28,470	130,705
Connecticut	1890	204,864	73,134	3,400	118,665	6,201,876	889,756	5,312,120	9,788,951	1,665,390	8,123,561
	1880	115,040	41,693	.....	117,148	3,311,206	295,190	3,016,016	5,881,000	442,925	5,438,075
Illinois	1890	4,727	1,725	1,740	38,754	314,855	.....	314,855	785,845	.....	785,845
	1880	.....	.....	.....	42,575	125,895	.....	125,895	244,150	.....	244,150
Maryland	1890	6	205	.....	1,765	34,305	.....	34,305	100,361	.....	100,361
	1880	1,150	.....	.....	.....	15,760	.....	15,760	35,415	.....	35,415
Massachusetts	1890	69,976	48,149	870	115,081	3,251,893	746,175	2,505,718	5,557,569	945,610	4,611,959
	1880	64,725	15,775	.....	17,330	1,990,515	121,000	1,869,515	3,764,260	273,167	3,491,093
New Jersey	1890	155,650	143,132	33,453	155,992	17,908,883	5,205,501	12,703,382	30,760,371	5,354,389	25,405,982
	1880	482,472	78,548	.....	369,281	9,678,536	2,502,400	7,176,136	17,122,230	4,271,185	12,851,045
New York	1890	117,735	63,990	33,739	451,825	10,174,818	1,318,742	8,856,076	19,417,796	1,681,481	17,736,315
	1880	109,430	24,167	.....	134,192	5,331,804	533,600	4,798,204	10,170,140	802,115	9,368,025
Ohio	1890	.....	.....	.....	160	13,983	.....	13,983	33,927	.....	33,927
	1880	.....	.....	.....	2,575	19,495	.....	19,495	53,110	.....	53,110
Pennsylvania	1890	137,347	63,502	9,473	214,092	12,094,389	7,017,604	5,076,785	19,357,546	7,953,323	11,404,223
	1880	50,975	10,265	.....	167,270	1,830,985	404,000	1,426,985	3,491,840	638,675	2,853,165
Rhode Island	1890	998	.....	1,000	750	149,763	68,242	81,521	229,062	94,062	135,000
	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other states	1890	25,350	6,168	.....	18,427	713,254	288,000	425,254	995,114	444,060	551,114
	1880	970	480	.....	1,400	82,510	27,750	54,760	111,725	56,785	54,940

a See explanation, page 222.

The following summaries show the value of net production in the various classes of goods manufactured as reported at the census periods of 1880 and 1890:

VALUES OF FINISHED GOODS FOR THE CENSUS YEAR 1880.

Total	$34,519,723
Sewing silk	776,120
Machine twist	6,007,735
Floss silk	225,025
Dress goods	4,115,205
Satins	1,101,875
Tie silks and scarfs	606,675
Millinery silks	891,955
Other broad goods	627,595
Handkerchiefs	3,881,590
Ribbons	6,023,100
Laces	437,000
Braids and bindings	999,685
Fringes and dress trimmings	4,950,275
Cords, tassels, passementeries, and millinery trimmings	1,866,575
Upholstery and military trimmings	1,392,355
Coach laces and carriage trimmings	37,510
Undertakers', hatters', and fur trimmings	59,805
Mixed goods and silk values therein	519,643

VALUES OF FINISHED GOODS FOR THE CENSUS YEAR 1890.

Total	$69,154,599
Machine twist and sewing silk	7,068,213
Fringe, knitting, embroidery, and floss silk	1,849,631
Dress goods, figured and plain	15,183,134
Tailors' linings	3,011,437
Tie silks and scarfs	919,919
Other broad goods	1,928,036
Handkerchiefs	1,913,224
Ribbons	17,081,447
Laces	261,750
Braids and bindings	2,771,382
Velvets and plushes	3,141,026
Upholstery goods:	
Curtains	471,324
Tapestries	1,330,287
Other upholstery broad goods	1,910,721
Gimps and trimmings	3,918,209
Dress and cloak trimmings	4,403,757
Military trimmings	232,600
Hosiery and knit goods:	
Shirts and drawers	26,421
Hosiery	141,183
Mittens, gloves, etc	897,904
Jersey cloth	90,664
Other products	602,330

The values stated in the foregoing summaries represent the value of the product at the factory. The term "net production" signifies the quantity and value of finished goods after allowance has been made for materials "twice included", which is fully explained hereafter in this report.

From the foregoing summaries it will be seen that the value of net production increased from $34,519,723 in 1880 to $69,154,599 in 1890, an increase of $34,634,876, or 100.33 per cent. In considering these figures, however, the fact should be borne in mind that, although values had declined not less than 25 per cent, as estimated by competent authorities, the amount of production in quantities shows a very marked increase.

Tables 2 and 3 show the quantities of silk goods produced in 1880 and 1890, but in this respect the report for the census of 1880 furnished a small basis for comparison with the more comprehensive report prepared for the census of 1890.

TABLE 2.—QUANTITIES OF SILK PRODUCTS: 1880.

STATES.	SEWINGS AND TWIST.	BROAD GOODS AND HANDKERCHIEFS.	RIBBONS AND LACES.	TRIMMINGS AND SMALL GOODS.
	Pounds.	Yards	Yards.	Pounds.
The United States	821,528	10,856,284	30,129,951	710,149
California	9,500			4,650
Connecticut	394,981	2,253,070	8,541,235	695
Illinois				12,220
Kansas			3,600	
Maine	4,225			
Maryland				1,784
Massachusetts	273,816	99,120	573,320	39,789
Missouri				65
New Hampshire	1,300			300
New Jersey	25,580	6,975,655	8,794,100	50,405
New York	88,765	1,427,439	10,302,696	403,330
Ohio				2,187
Pennsylvania	23,110	101,000	1,915,000	192,924
Rhode Island				1,900
Vermont	251			

TABLE 3.—QUANTITIES OF SILK PRODUCTS: 1890.

STATES.	Number of establishments.	SEWINGS AND TWIST. (a)	BROAD GOODS AND HANDKERCHIEFS. (b)			RIBBONS AND LACES.	TRIMMINGS AND SMALL GOODS. (c)					
		Pounds.	Yards.	Square yards.	Pairs.	Dozens.	Pieces.	Pieces.	Yards.	Dozens.	Gross.	Pairs.	Pounds.
The United States	472	1,449,462	30,171,673	4,642,820	71,049	393,902	25,737,211	5,201,128	217,944	491,512	190,984	2,000	1,140
California	9	18,829						64,060	7,944	1,105	160		
Connecticut	35	770,428	2,747,420	675,117	1,904	5,717	872,783	64,942		3,750	18,341		
Illinois	10			1,000				265,024	75,000		1,000	2,000	
Maryland	4						33,290	11,000					
Massachusetts	20	390,683	744,383					331,727		11,395	1,698		1,140
New Jersey	132	44,568	18,180,072	514,295	13,820	386,520	14,629,214	164,036	500	45,936	62,000		
New York	185	44,168	4,795,552	726,474	44	1,665	8,447,441	3,276,284	94,500	408,577	106,618		
Ohio	3							11,260					
Pennsylvania	66	144,173	3,431,093	2,725,934	55,281		1,664,608	983,915		20,749	1,167		
Rhode Island	3						89,875		40,000				
All other states (d)	5	36,613	273,153					28,280					

a Includes 329,637 pounds of "fringe, knitting, embroidery, and floss silk", divided as follows: California, 4,515; Connecticut, 121,177; Massachusetts, 75,658, New Jersey, 27,593; New York, 3,779; Pennsylvania, 81,915; "All other states", 15,000.

b Includes in "Broad goods" the following: dress goods, figured and plain; tailors' linings, tie silks and scarfs, "Other broad goods", tapestries, curtains; velvets and plushes, and "Other upholstery broad goods".

c Includes gimps and trimmings, braids and bindings, dress and cloak trimmings, military trimmings, hosiery and knit goods, and jersey cloth. (Jersey cloth as follows: United States, 75,444 yards, viz., California, 444, and New York, 75,000.)

d Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maine, 1; Michigan, 1; Missouri, 1; North Carolina, 1; Virginia, 1.

DEVELOPMENT OF SILK MANUFACTURE.

In addition to what has been shown regarding the increase in both value and quantity of production during the past decade, a very great advance has ensued in the development of the manufacture through the production of new classes of goods, as well as the consequent increased employment of silk fabrics for many uses previously unknown.

In the meantime the great improvement and increased beauty and variety of designs in our figured silk fabrics attest the rapid advance made in the domestic industry, while qualities have steadily improved in nearly every direction, notwithstanding the decline in prices. Among other noteworthy features distinguishing the past decade may be mentioned the spread of the industry through the establishment of mills at numerous points outside the

recognized seats of the industry in 1880; the almost absolute retirement of the hand loom in weaving broad goods and ribbons, the marked decline in the price of raw silk, and the great improvement in nearly every department of machinery and appliances. The latter feature has led to increased economy in manufacture and larger diversification of product, there being in fact scarcely any class of silk goods required by American consumers not now produced in this country and upon American looms.

Last, but not least, may be mentioned the ascendency in volume of domestic silk fabrics over imported goods. The percentages of silk goods made in the United States, as compared with the whole consumption of such goods in the country at the past four censuses are as follows:

	PER CENT.
1860	13
1870	23
1880	38
1890	55

Each of the features above noted is of sufficient importance to merit more extended reference, since all are factors in the history of the past decade; further allusion will be made to them elsewhere in this report.

SEWING SILK AND MACHINE TWIST.

Taking up in detail the more important lines of the manufacture, consideration may properly be first given to the oldest, that of sewing silk. Previous to 1810 this production, as well as such other manipulation of silk as then existed in the United States, was a household industry. The erection in that year at Mansfield, Connecticut, of a small 1-story frame building, 12 feet square (still standing), and the employment of a water wheel as the motive power for the single crude spinning frame which it contained, may justly be considered the inauguration of silk manufacture as a factory industry in this country. At the census of 1850 the value of sewing silk production had grown to $1,209,426 out of a total value of $1,809,476 for all silk goods manufactured. The adaptation of silk thread or twist for use on the sewing machine, occurring in 1852, created the new classification of "machine twist" and gave immense impetus to this branch of silk industry. At the census of 1880 its production amounted in value to $6,783,855, sewing silk being credited with $776,120 and machine twist with $6,007,735. At the census of 1890 the returns for the two items were consolidated, the total value produced in that year being $7,068,213, an increase of $284,358, or 4.19 per cent. That this increase in value of production was not larger resulted from a decided falling off in price during the past decade. The weight produced in 1880 was 791,525 pounds (*a*), while in 1890 it was 1,119,825 pounds (*b*), an increase of 328,300 pounds, or 41.48 per cent. The ever increasing use of the sewing machine has fully sustained this industry, so that the manufacture of machine twist is at present one of great importance. The manufacture of this class of goods, as in 1880, is more extensively carried on in the states of Massachusetts and Connecticut than elsewhere.

FRINGE, KNITTING, EMBROIDERY, AND FLOSS SILKS.

Fringe, knitting, embroidery, and floss silks are produced by the manufacturers of spun silk and machine twist and sewing silks, and the product has been developed largely since the Tenth Census. The returns for 1880 showed a value in product of floss silk of $225,025, including fringe, knitting, and embroidery silks. In 1890 the value of the combined production aggregated $1,849,631, an increase of $1,624,606, or 721.97 per cent, having kept pace with the largely increased demand for this class of goods for use in art decoration and other purposes.

BROAD SILKS.

The generic or commercial term of "broad silks" is applied in this report to all silk woven fabrics other than handkerchiefs, ribbons, velvets and plushes, upholstery goods, and trimmings of the character designated in the classification hereinafter shown. To better illustrate the growth of this branch of the industry historical reference becomes necessary. Previous to 1840 little, if anything, had been accomplished therein save as a household industry. In that year a start in a small way was made at Paterson, New Jersey, but the insignificant growth of broad silk weaving in the decade following is shown by the returns for the census of 1850, which reported the value of "silk cloth" produced at $17,050. At the census of 1860 no mention whatever was made of this class of production. During the war the production was greatly stimulated, owing in part to frequent deficiencies in the foreign supply and in part to the excessive cost due to the high price of gold, which greatly checked importation. At the close of the war (in 1865) the weaving of broad silks had attained considerable importance and may be regarded as having then become firmly established. Hence very nearly all that has been achieved in this branch

a The total quantity of sewings and twist produced in 1880, reported at the Tenth Census, was 821,528 pounds, but in this amount was included floss silk (which also embraced fringe, knitting, and embroidery silk) to the value of $225,025. The average value of this latter product in that year may be placed at $7.50 per pound, which would give 30,003 pounds as the amount of production, leaving 791,525 pounds as the amount of machine twist and sewing silk produced.

b It will be seen by reference to footnote *a* in Table 3, showing "quantities of silk products: 1890", that from the total of 1,449,462 pounds given for sewings and twist 329,637 pounds of fringe, knitting, embroidery, and floss silk should be deducted, leaving 1,119,825 pounds as the production of machine twist and sewing silks.

of industry has been accomplished within the past twenty-five years. The returns of the Ninth Census reported an annual production of 1,026,422 yards, the value not being given. The value of production reported at both the Tenth and Eleventh Censuses is shown herewith:

BROAD SILKS.

PRODUCTS.	1880	1890
Total	$7,343,305	$21,042,526
Dress goods	4,115,205	15,183,134
Satins	1,101,875	.....
Tailors' linings	.....	3,011,437
Tie silks and scarfs	606,675	919,919
Millinery silks	891,955	.....
Other broad goods	627,595	1,928,036

It will thus be observed that the total value of production in this branch of silk industry in 1890 amounted to $21,042,526, an increase over 1880 of $13,699,221, or 186.55 per cent. Allusion has already been made to the great progress within the past decade in the whole industry in a more extended range of production, and nowhere does this more aptly apply than in the domain of broad silk weaving. The classification is now, in fact, almost illimitable, practically embracing everything made in other and older silk manufacturing countries, while in quality of weave, combination of colors, beauty of design, and excellence of finish the manufacturers are able to meet all requirements. In the meantime, also, values have experienced a great decline, and prices to consumers are much below those prevailing at the time of the Tenth Census.

HANDKERCHIEFS.

The handkerchief production stands almost singly in showing a decline in the value of goods manufactured, having decreased from $3,881,590 in 1880 to $1,913,224 in 1890, a difference of $1,968,366, or 50.71 per cent. This results from the decided change which has occurred during the decade, especially within the past four or five years, in the requirements of the purchasing trade, the tendency being adverse to the class of goods made on American looms, particularly figured effects, and favoring those of oriental production, of which the importation into this country, especially from Japan, has recently grown to large proportions.

RIBBONS.

The development of ribbon manufacture during the past decade has been exceedingly rapid. Its production of $17,081,447 in 1890 stands second in value to that of broad silks, while it exceeds that of dress silks by the sum of $1,898,313. In 1880 the value of ribbons manufactured was reported at $6,023,100. The increase shown by the Eleventh Census is $11,058,347, or 183.60 per cent. Previous to 1861 a few feeble and insignificant efforts were made at various points toward producing this class of goods, but it was not until the commercial exigencies created by the civil war that, similarly to broad silks, ribbon production obtained as a permanent domestic industry, the first mill of real importance having been established at Williamsburg, New York, in 1863. In 1870 the Ninth Census showed a production of 3,224,264 yards, and from that date the progress of this branch of the industry has been marked. The remarks made concerning broad silks apply with equal force to ribbons in both diversification and excellence of product. Goods of a character and beauty the production of which ten years ago the manufacturer would have hardly ventured to predict would be attempted within that period now constitute a large portion of the regular output, while the exceedingly low prices at which they are offered to consumers has created a demand for their use for many purposes never before contemplated.

LACES.

The production of laces for dress and millinery purposes shows a falling off from $437,000 in 1880 to $261,750 in 1890, a decrease of $175,250, or 40.10 per cent. A considerable portion of the decrease can be attributed to the fact that under the Tenth Census lace mitts were classified as laces, while under the Eleventh Census they are included with mittens and gloves.

BRAIDS AND BINDINGS.

In braids and bindings the returns show a value in production of $2,771,382 in 1890, against $999,685 in 1880, an increase of $1,771,697, or 177.23 per cent. In 1880 (fiscal year) the invoice value of this class of goods imported into the port of New York amounted to $1,323,437, and in 1890 it was $1,707,154.

VELVETS AND PLUSHES.

The manufacture of velvets and plushes, with a product in 1890 valued at $3,141,026, has come into existence since the Tenth Census. No separate classification of the two items is made in the summary showing the value of production, but the value of the output of plushes largely exceeds that of velvets. The velvets produced here have been mostly utilized for millinery and dress trimming purposes, while the plushes are largely employed in upholstery. So far only plain goods, made of "schappe" or spun silk with cotton backs, have been manufactured here, no production having been attempted of the high figured effects in both lines, such as are seen among the artistic creations of the Lyons weavers or of the foreign rich all-silk plain velvets.

UPHOLSTERY GOODS.

Under the general head of "Upholstery goods" the summary for 1890 shows the following values of goods produced composed of silk, or of which silk was the component material of chief value: curtains, $471,324; tapestries, $1,330,287, and other upholstery broad goods, $1,910,721; a total of $3,712,332. At the Tenth Census no mention was made of goods of this character; the industry has made rapid progress within the past decade, especially in the city of Philadelphia, the chief center for this class of silk goods. Curtains largely made of silk, but with some admixture of cotton, are now offered to consumers at a less price than were "all cotton" goods ten years ago, while tapestries, principally used in furniture coverings, are fully 30 per cent cheaper and of much better design and quality. Equally in "Other upholstery broad goods", such as brocatelles, light silk damasks for draperies, silk chenilles, etc., the improvement has been exceedingly rapid. The goods produced are sold at lower prices than ever before, and the industry is capable, under favorable conditions, of much larger expansion and diversification of product.

TRIMMINGS.

The variance in classification in the summaries of finished production between the Tenth and Eleventh Censuses renders it somewhat difficult to make a correct detailed comparison. This is especially so in the item of trimmings. The following statement, however, is presented:

PRODUCTS.	1880	1890
Upholstery and military trimmings	$1,392,355	
Coach laces and carriage trimmings	37,510	
Total	1,429,865	
Upholstery gimps and trimmings		$3,918,209
Military trimmings		232,600
Total		4,150,809
Fringes and dress trimmings	4,950,275	
Cords, tassels, passementerie, and military trimmings	1,866,575	
Undertakers (a), hatters', and fur trimmings	59,805	
Total	6,876,655	
Dress and cloak trimmings		4,403,757

a Undertakers' trimmings should properly be classed with "Upholstery trimmings", but in 1880 they were classed with "Hatters' and fur trimmings".

This statement shows that the reported value of the entire production of trimmings in 1880 was $8,306,520, while in 1890 it was $8,554,566, an increase of $248,046, or 2.99 per cent, and that while the production of upholstery and military trimmings combined increased in the sum of $2,720,944, or 190.29 per cent, that of dress and cloak trimmings decreased $2,472,898, or 35.96 per cent. The decrease in the latter item can be attributed only to adverse fashions in the use of both dress and cloak trimmings, ribbons having largely taken their place for dress garniture, while plainer styles of cloaks were in favor. This class of goods is perhaps more at the mercy of the ever changing whims of fashion than any other line of the industry.

HOSIERY AND KNIT GOODS.

The manufacture of hosiery and knit goods, with its total production of $1,156,172, is practically a development of the past ten years, no separate mention of goods of this character having been made at the census of 1880. The industry is thriving and rapidly assuming importance, the goods produced being of the highest possible grade.

NUMBER OF ESTABLISHMENTS.

The census of 1880 reported 382 establishments engaged in the silk industry in that year, which included some of those employed exclusively in silk dyeing, finishing, etc., the number of which was less than in 1890. The number of establishments reported in 1890 was 472, being all silk manufacturing concerns, an increase of 90, or 23.56 per cent. To these should be added 52 establishments engaged exclusively in silk dyeing and finishing, making a total for the whole industry of 524 establishments, a net increase over 1880 of 142 establishments, or 37.17 per cent.

The following comparative statement for 1880 and 1890 shows, by states, the number of establishments engaged in the industry (including dyeing and finishing) and the increase or decrease in each:

STATES.	NUMBER OF ESTABLISHMENTS.		Increase.	Decrease.
	1880	1890		
The United States	382	524		
California	5	9	4	
Connecticut	28	36	8	
Illinois	5	11	6	
Kansas	1			1
Maine	1	1		
Maryland	4	4		
Massachusetts	22	20		2
Michigan		1	1	
Missouri	1	1		
New Hampshire	1			1
New Jersey	106	156	50	
New York	151	206	55	
North Carolina		1	1	
Ohio	6	3		3
Pennsylvania	49	71	22	
Rhode Island	1	3	2	
Vermont	1			1
Virginia		1	1	

The following statement, reproduced from the report on "The Dyeing and Finishing of Textiles", shows the number of establishments, amount of capital, miscellaneous expenses, average number of employés and their wages, power used, cost of materials used, and total value of work done in establishments devoted exclusively to dyeing and finishing silk goods and yarns:

ESTABLISHMENTS ENGAGED EXCLUSIVELY IN DYEING AND FINISHING SILK GOODS AND YARNS.

STATES.	Number of establishments.	CAPITAL.		Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)				
		Value of hired property.	Direct investment.		Aggregates.		Males above 16 years.	Females above 15 years.	Children.
					Average number.	Total wages.			
The United States	52	$487,933	$1,880,224	$177,933	1,745	$1,013,325	1,639	102	4
New Jersey	24	193,800	1,313,306	123,607	1,292	744,059	1,233	57	2
New York	21	285,133	466,505	47,706	391	230,034	344	45	2
All other states (b)	7	9,000	100,413	6,620	62	39,272	62		

STATES.	HORSE POWER.			COST OF MATERIALS USED.					Value of work done.
	Steam.	Water.	All other.	Total.	Chemicals and dyestuffs.	Fuel.	Rent of power and heat.	All other materials.	
The United States	1,513	21	10	$1,276,926	$1,092,192	$83,475	$4,675	$96,584	$2,935,101
New Jersey	777		10	1,127,346	987,957	70,582	600	68,207	2,333,716
New York	545			111,129	75,012	9,498	4,075	22,544	478,637
All other states	191	21		38,451	29,223	3,395		5,833	122,748

a Includes officers, firm members, and clerks.

b Includes states grouped, in order that the operations of individual establishments may not be disclosed. These establishments were distributed as follows: Connecticut, 1; Illinois, 1; Pennsylvania, 5.

LOCATION OF SILK MILLS.

Allusion has been made to the spread of the industry during the past decade through the establishment of mills at numerous points outside the recognized centers of the industry in 1880.

A large portion of the spread of the industry to new points has resulted from the location by manufacturers elsewhere engaged therein of "annex" establishments devoted mainly to the "throwing" branch, in which women and children are principally employed, the work being of the lightest kind. This has occurred notably in the state of Pennsylvania, where, in addition to a plentiful supply of otherwise unemployed labor of the character mentioned, fuel is comparatively cheap. The location of mills in this state, as well as in some instances in other states, has, furthermore, been greatly stimulated by the financial inducements offered by various towns, the citizens of which have wished to secure an industry in their localities furnishing light, agreeable, and remunerative employment. Hence liberal subscriptions have been made toward the erection of mills. While these isolated establishments, as a rule, were at the first mere "annexes" devoted to the "throwing" of material to be woven at the parent establishment in one or another of the chief centers of the manufacture, weaving was later also entered upon, while especially among those established in the latter half of the past decade there are a number of well equipped factories, embracing all the branches, from the spindle to the loom.

The question of advantage or disadvantage of an isolated location presents a problem which has been widely discussed. On the one side are cheaper fuel, cheaper help, lower taxes, less expense for factory space, etc., while on the other there are the advantages of proximity to market, to expert textile machinists, and to depots for all manner of supplies, and also of having trained employés, who can hardly be induced to remove to country towns, where almost all the operatives must first be instructed in their several tasks. But whatever the advantages or disadvantages of a remote location, the "throwsters" at the principal centers have found it difficult to compete with these outside establishments, the difference in wages alone being a most important factor.

CAPITAL.

The returns for capital are far more complete at the Eleventh Census than any previously obtained, embracing in detail the "Live assets" and also the "Value of hired property", while at the Tenth Census they were largely confined to the actual investments of manufacturers, and did not include the "Value of hired property", which under the Eleventh Census aggregates $10,355,160, making a total of $61,362,697. In making comparisons with the Tenth Census this amount is omitted. Direct investment in 1890 amounts to $51,007,537 (*a*), as against $19,125,300 in 1880, an increase of $31,882,237, or 166.70 per cent. The items of "Value of land and buildings" and "Total value of machinery" are the only ones with which the returns of 1880 can be fairly compared. The value of land and buildings increased from $3,836,600 in 1880 to $6,904,628 in 1890, an increase of $3,068,028, or 79.97 per cent, while the value of the machinery employed increased from $5,227,500 in 1880 to $14,181,680 in 1890, an increase of $8,954,180, or 171.29 per cent. In 1880 the combined value of land and buildings and machinery was $9,064,100, leaving $10,061,200 as the amount otherwise included as capital, the respective percentages of the above to the whole sum of $19,125,300 being 47.39 and 52.61. In 1890 the combined value of the same items was $21,086,308, leaving $29,921,229 as the amount otherwise included as capital, the respective percentages to the whole sum of $51,007,537 being 41.34 and 58.66. In 1880 the value of finished goods produced for each dollar of capital invested was $1.80, and in 1890 it was $1.36. Although these figures apparently show that the producing capacity of capital was smaller in 1890 than in 1880, the fact that "Live assets" were more fully reported under the Eleventh than under the Tenth Census, and the great decline in prices of products, already alluded to, should be considered in this connection. A careful analysis of these two items will demonstrate that the ratio of production to capital in 1890 was considerably larger than in 1880.

EMPLOYÉS AND WAGES.

The returns show that the average number of employés in 1890 was 50,913 (*b*), while in 1880 it was 31,337, the increase amounting to 19,576, or 62.47 per cent.

The following statement shows the increase or decrease in number and percentage of males, females, and children employed in 1890 as compared with 1880:

AVERAGE NUMBER OF EMPLOYÉS.	1890	1880	INCREASE.		DECREASE.	
			Number.	Per cent.	Number.	Per cent.
Males above 16 years	18,998	9,375	9,623	102.65		
Females above 15 years	29,049	16,396	12,653	77.17		
Children	2,866	5,566			2,700	48.51

a In addition to these amounts, 52 establishments engaged exclusively in dyeing and finishing silk goods and yarn in 1890 report "hired property" to the value of $487,933 and a direct investment of $1,880,224.

b To these amounts should be added 1,745 employés and $1,013,325 wages, reported by 52 establishments engaged in dyeing and finishing silk goods and yarn, making the total number of employés in the silk industry 52,658, to whom $20,693,643 was paid in wages.

Notwithstanding the growth of the industry, the decrease in the number of children employed is very noticeable, being largely due to the stringent laws which have been enacted during the decade in several states regulating the employment of children in factories.

The total amount paid in wages in 1890 was $19,680,318 (*a*), as against $9,146,705 in 1880, an increase of $10,533,613, or 115.16 per cent.

The following comparative statements show the rates of wages paid per week to classified operatives in 1880 and 1890. It is proper to mention, however, that only 65 per cent of the establishments made detailed reports on this subject in 1890.

RATES OF WAGES PER WEEK TO CLASSIFIED OPERATIVES: 1880.

CLASSES OF OPERATIVES	Males.	Females.	CLASSES OF OPERATIVES.	Males.	Females.
Raw silk winders		$5.25	Lace machine operators	$14.75	
Raw silk cleaners		3.37	Braid machine operators	16.00	
Raw silk doublers		5.18	Braiders		$5.41
Raw silk spinners	$5.57	4.87	Passementerie spinners	17.73	12.00
Raw silk twisters	5.98	5.67	Fringe knotters		5.30
Raw silk reelers		4.50	Tassel makers		5.29
Soft silk doublers		4.00	Finishers	13.50	
Soft silk winders		6.35	Designers (*c*)	24.71	
Soft silk spoolers		4.96	Card cutters (*d*)	11.68	
Soft silk warpers	10.71	7.62	Dyers (*e*)	12.77	
Quillers and quill winders		4.00	Engineers	12.33	
Soft silk beamers	12.11	7.72	Machinists	12.40	
Soft silk warp twisters	13.96		Loom fixers	15.87	
Hand loom weavers (*b*)	14.15	8.44	Laborers	8.73	
Power loom weavers (*b*)	11.43	7.94			

RATES OF WAGES PER WEEK TO CLASSIFIED OPERATIVES: 1890.

CLASSES OF OPERATIVES.	Number of establishments.	Males.	Females.	Children.
Raw silk winders	126		$5.24	$3.10
Raw silk cleaners	18		4.71	2.93
Raw silk doublers	111		5.07	3.03
Raw silk spinners	96	$6.70	4.85	3.58
Raw silk twisters	68	7.52	5.25	3.15
Soft silk winders	193		6.31	3.34
Soft silk spoolers	123	6.09	5.71	3.56
Soft silk warpers	142	13.60	8.74	3.25
Soft silk beamers	56	11.26	9.40	
Soft silk warp twisters	91	13.35	10.00	
Hand loom weavers	59	14.09	8.52	
Power loom weavers:				
Broad goods	108	11.16	9.04	
Ribbons	79	15.74	11.28	
Braiding machine operatives	30	8.48	6.00	
Knitting machine operatives	14	16.00	8.00	
Lace machine operatives	4	13.00		
Designers	17	23.18	16.50	
Card cutters	25	15.05	8.50	
Dyers	16	16.00		
Finishers	58	13.87	10.12	
Laborers	10	9.29	4.50	
Other operatives	82	12.34	6.89	3.95

a See note *b* on page 219.

b There is a very great difference in the size of looms for different kinds of goods. The highest rates to power loom weavers are paid to those employed on the large looms used in fringe and trimming manufactures.

c The designer is sometimes also the superintendent.

d The card cutter is sometimes also the designer.

e The chief dyer receives from $20 to $30.

MACHINERY.

BROAD GOODS LOOMS.

Allusion has heretofore been made to the decrease in the employment of hand looms within the past census decade. In 1880 the total number of looms reported in use for weaving broad goods was 4,732; of this number 1,629 were hand looms and 3,103 power looms. In 1890 but 413 hand looms were reported in use, the decrease being 1,216, or 74.65 per cent. In 1880 the respective percentages of hand and power looms employed in this branch were 34.43 and 65.57. In 1890 the total number of broad looms employed was reported at 15,279, of which 413 were hand looms and 14,866 power looms, the total increase over 1880 being 10,547, or 222.89 per cent; of this number 14,866 were power looms, the increase in these being 11,763, or 379.08 per cent. In 1890 the respective percentages of hand and power looms employed in this branch were 2.70 and 97.30.

NARROW GOODS LOOMS.

In 1880 the total number of looms employed in the combined production of ribbon and other narrow goods (no subclassification being made) was 3,742; of this number 1,524 were hand looms and 2,218 power looms. In 1890 1,334 hand looms were reported in use, the decrease being 190, or 12.47 per cent. In 1880 the respective percentages of hand and power looms employed in this branch were 40.73 and 59.27. In 1890 the total number of looms engaged in this branch was reported at 7,290, of which 1,334 were hand looms and 5,956 power looms, the total increase over 1880 being 3,548, or 94.82 per cent. Of the total number, 5,956 were power looms, the increase being 3,738, or 168.53 per cent. Of these 5,956 power looms 4,389 were reported as engaged in the production of ribbons and 1,567 on "Other narrow goods". In 1890 the respective percentages of hand and power looms employed in this branch were 18.30 and 81.70.

Adding together the looms for broad goods and narrow goods, it is found that the total number of hand looms employed in 1880 was 3,153 and of power looms 5,321, making an aggregate of 8,474, while in 1890 there were 1,747 hand looms and 20,822 power looms, an aggregate of 22,569, showing an increase in the latter year of 14,095 looms, or 166.33 per cent. The respective percentages of hand and power looms employed in 1880 were 37.21 and 62.79; in 1890 they were 7.74 and 92.26.

These figures furnish ample warrant for the statement that the hand loom is now a factor of but little importance in silk manufacture; in fact, for weaving broad goods and ribbons but few were in operation at the Eleventh Census. A comparatively small number are employed in making patterns, bookmarks, and badges, while others are engaged in weaving fine veilings, tissues, or other special productions, but the larger proportion is employed in the trimmings branch. This falling into desuetude of the hand loom has been a natural result of the progress of the decade, high speed and the most economical methods having become matters of paramount importance, while the marvelous advance in perfected power driven machinery, on which the most difficult classes of work, including even swiveled effects, can now be executed, has rendered it obsolete, except for the few special purposes indicated.

Referring to the great advance in machinery and appliances employed in silk manufacture, it should be stated that while considerable progress had been made in this department prior to the Tenth Census great and vitally important improvements have since been achieved in all classes of silk machinery. Especially is this the case in power looms for weaving both broad and narrow goods, which have been brought to a high degree of perfection, the natural effect of which has not only lessened the cost of production but resulted in the manufacture of a higher class of fabrics of a character in many instances never before attempted in this country.

Among the most important improvements in this direction is the adaptation of the swivel loom attachment to the power loom. This loom produces swivel or embroidered effects even more satisfactorily than was formerly achieved by the hand loom, which had been regarded hitherto as the only loom on which swivel work could be performed. The capacity of production by the power of the swivel loom is many times greater.

SPINDLES.

The following tabular statement shows the increase in the number of spindles of the various kinds employed in 1890 over 1880, together with percentages of such increase:

SPINDLES.	1890	1880	INCREASE.	
			Number.	Per cent.
Total	1,254,798	508,137	746,661	146.94
Winding, cleaning, and doubling	369,035	164,218	204,817	124.72
Spinning and twisting	718,360	262,312	456,048	173.86
Braiding	167,403	81,607	85,796	105.13

The speed of the modern spinning frame has been accelerated to an extent which some years since would have seemed almost impracticable. But a short time before the census of 1880 throwing machinery was introduced, the spindles of which made 10,000 revolutions per minute, which was almost double the speed previously attained. Subsequently 12,000, 15,000, and even more revolutions were achieved, but in time it was ascertained that there was a point beyond which no advantage was gained by increasing the speed, and hence the tendency of late has been rather toward reducing it, the results being generally more satisfactory. At present about 10,000 revolutions per minute for the "first time over" and about 7,500 revolutions for the "second time over" is the average speed at which spindles are operated on the latest improved machinery, while on frames of less modern construction the speed is very much lower, often not exceeding 5,000 or even 4,000 revolutions.

Equally, as in looms and spinning machinery, has there been a great improvement in all other mechanical appliances, such as winders, doublers, wrappers, quillers, and jacquard dobbies, the running speed of all of which has undergone large increase. The number and kinds of other mechanical accessories reported in use at the Eleventh Census are as follows: jacquard attachments, 5,905; sewing machines, 1,032; knitting machines, 245; lace machines, 78.

MATERIALS USED.

The gross cost of all materials and supplies consumed in 1880 was $22,467,701; in 1890 it was $51,004,425, an increase of $28,536,724, or 127.01 per cent. In 1890 the cost of raw silk and silk materials consumed constituted 90.88 per cent of the cost of all materials used; in 1880 it was 85.49 per cent. In 1890 the gross value of manufactured products was $87,298,454, the percentage of the gross cost of materials and supplies being 58.43 of the product, while in 1880 the percentage was 54.76. The cost of raw silk and silk material consumed in 1890 was $46,351,200. From this amount should be deducted the sum of $15,537,520 for silk material "twice included".

Silk material is "twice included" when it appears, first, as "raw silk" in the returns of a "throwster", and, secondly, as "thrown silk" or "fringe silk", reported as raw material in the return of a weaver or fringe maker. The value of silk products thus twice included is deducted from the gross value of production, leaving a result, which, it will be noticed, exactly agrees with the value of finished goods as shown by the returns. The reasons for this deduction are similar to those which apply to the values of the raw materials. While the gross value of production amounts to $87,298,454, it covers only a real value of product amounting to $69,154,599. It should be noted that the products of partial manufacture go for the most part to be finished to points other than those where they originate. Hence, in many cases, the gross production of a state more nearly represents its industry than would the value of its finished goods. For instance, the gross production of Pennsylvania, amounting to $19,357,546, is much nearer the total value of its silk manufactures than the sum of $11,404,223, the value of its completed goods, because a large portion of the thrown silk produced in that state is not made into goods there, but goes elsewhere for manufacture.

The reference to "thrown silks" justifies some allusion to the throwing branch of the manufacture. Raw silk as reeled from the cocoon differs from the fiber or filament forming the material for other textiles, in that while it is necessary to spin the latter down to a thread of sufficient fineness to weave, it becomes necessary in the use of raw silk to twist or "throw" together a number of the filaments sufficient to form a thread coarse enough to weave. Hence comes the word "throwster", an old English term by which those engaged in this preparatory process of the manufacture are designated, the warp and weft produced by them being known, respectively, as "organzine" and "tram", words derived from the French "organzin", meaning a double-twisted silk, and "tram", meaning weft. In establishments exclusively engaged in this branch the work is generally done on commission for other establishments engaged in weaving, the latter furnishing the raw stock. The returns for 1890 show about 44 establishments of this character, while, in addition, many weaving concerns possess their own throwing plants.

IMPORTS OF RAW SILK.

The following tabular statement exhibits the imports of raw silk by fiscal years from 1880 to 1890, inclusive, as reported by the bureau of statistics, Treasury Department, with number of pounds and value. The receipts of raw silk at the ports of New York and the Pacific coast are likewise presented in number of bales and cases since 1880, according to the records of the Silk Association of America. For purposes of comparison, the imports in the years 1850, 1860, 1870, and 1880 are also presented. Attention is directed to the marked increase in the importation of raw silk.

IMPORTS OF RAW SILK.

[From reports of the bureau of statistics, Treasury Department.]

YEARS.	Pounds.	Value.	Number of bales and cases received at the ports of New York and the Pacific coast.
1850	*a*120,010	$401,385	.....
1860	*a*297,877	1,340,676	.....
1870	583,589	3,017,958	.....
1880	2,562,236	12,024,699	21,741
1881	2,550,103	10,888,264	20,198
1882	2,879,402	12,890,392	21,682
1883	3,253,370	14,043,340	23,927
1884	3,222,546	12,481,496	23,067
1885	3,424,076	12,421,739	23,914
1886	4,754,626	17,232,505	32,997
1887	4,509,574	18,687,245	31,974
1888	5,173,840	19,151,208	36,108
1889	5,329,646	18,544,025	37,583
1890	5,943,360	23,285,099	43,766

a Estimated from current prices, only the value being on record.

The tendency during the last decade has been toward the increased use of finer grades of raw silk as a consequence of the better qualities of goods manufactured. This is demonstrated by the following comparative statement, which gives the valuation of imports of the different classes at the ports of New York and the Pacific coast, as shown by the records of the Silk Association of America (*a*), for the fiscal years 1889–1890 and 1882–1883. The first year for which this classification was kept was 1882–1883, and hence is the first classification that can be presented for comparison.

CLASSES.	1889–1890	1882–1883	INCREASE.	
			Value.	Per cent.
Strictly European	$6,060,776	$3,716,609	$2,344,167	63.07
Japan	12,499,498	6,379,115	6,120,383	95.94
Shanghai	3,491,579	2,768,323	723,256	26.13
Hongkong	2,603,108	1,823,537	779,571	42.75

Reference has been made to the decline which has taken place in the prices of raw silk. This decline may be estimated from the average prices current at the two fiscal years of 1880 and 1890, amounting to from 15 to 30 per cent, which is largely the result of the increased demand consequent upon the development of American manufacture and the stimulation of raw silk production thereby engendered in other countries.

a It will be observed that the valuation of the imports as given by the Silk Association of America in both the years mentioned somewhat exceeds that of the bureau of statistics, although the former does not include ports of entry other than those specified above. The amount brought in at other ports, however, is infinitesimal, while the figures of the bureau of statistics simply relate to the value of the raw silk at the place of export and do not include the expenses of shipping charges, commissions, freight, marine insurance, and the Japanese export duties, as do the estimates of the Silk Association of America.

WASTE SILK, PIERCED COCOONS, AND NOILS.

In addition to the imports of raw silk, the following statement, showing the imports of waste silk, pierced cocoons, and noils from 1880 to 1890, is presented. The manipulation of spun silk was in its infancy in this country ten years ago, but it has kept pace in the development of the industry with the use of reeled silk, and is a factor of no small importance.

IMPORTS OF WASTE SILK, PIERCED COCOONS, AND NOILS.

[From reports of the bureau of statistics, Treasury Department.]

YEARS.	Pounds.	Value.
1881		$559,914
1882		672,384
1883	1,477,736	1,099,812
1884	1,062,342	744,633
1885	884,832	464,490
1886	2,063,434	1,021,763
1887	1,428,517	950,840
1888	1,196,482	778,934
1889	1,315,478	787,885
1890	1,567,080	1,040,432

IMPORTATIONS OF GOODS.

The following comparative statement shows the value of silk goods, by classes, imported at the port of New York, by fiscal years, from 1881 to 1890, inclusive. The imports at New York comprise fully 95 per cent of the total value of silk imports. The largest importation in any year previous to 1881 was in 1872, amounting to $36,448,618. This table exhibits the classes and invoice value of silk goods of foreign manufacture consumed in the United States.

TABLE 4.—INVOICE VALUE OF SILK GOODS, BY CLASSES, IMPORTED AT THE PORT OF NEW YORK, BY FISCAL YEARS, FROM 1881 TO 1890, INCLUSIVE.

[Compiled by Mr. Briton Richardson, secretary of the Silk Association of America.]

ARTICLES.	1889-1890	1888-1889	1887-1888	1886-1887	1885-1886	1884-1885	1883-1884	1882-1883	1881-1882	1880-1881
Total	$36,766,090	$34,057,170	$31,455,215	$29,366,924	$26,147,635	$26,108,190	$34,039,697	$33,967,171	$36,432,706	$30,501,851
Silk piece goods	13,589,511	10,648,570	11,465,076	11,263,296	11,431,840	12,423,750	18,432,599	18,585,896	19,429,606	16,167,056
Satins	486,268	535,414	568,281	534,051	432,789	291,317	173,784	109,666	200,763	272,641
Crapes	126,452	160,472	230,689	247,174	403,763	404,730	473,568	479,962	536,277	489,560
Pongees	11,217	49,761	87,234	16,624	82,374	35,497	24,667	30,938	8,651	16,477
Plushes	2,774,728	4,110,335	3,516,248	2,153,209	1,414,727	1,485,902	1,260,706	875,785	1,121,990	495,496
Velvets	2,482,401	1,883,403	2,746,729	3,527,953	2,747,736	2,786,045	2,831,410	1,940,015	1,402,663	1,575,715
Ribbons	1,692,611	1,617,401	1,194,458	1,240,846	1,253,717	1,243,974	2,618,463	2,229,226	2,707,693	3,103,564
Laces	2,972,655	3,320,131	2,361,735	2,135,393	1,820,692	1,614,374	2,126,979	3,126,597	4,073,891	1,883,236
Shawls	172,854	180,215	193,669	184,606	106,590	138,495	63,654	6,810	7,790	17,466
Gloves	399,425	345,950	379,064	478,153	503,823	610,950	652,942	333,716	170,151	204,703
Cravats	87,144	98,840	83,989	62,971	33,015	18,763	21,095	69,455	60,341	69,914
Handkerchiefs	99,227	146,297	281,015	163,851	169,948	158,298	120,743	59,786	75,671	53,727
Hose	395,096	292,500	317,897	350,169	270,735	327,649	317,861	297,960	179,254	110,277
Threads and yarns	461,311	308,797	162,506	190,445	159,189	129,996	193,782	155,282	128,790	175,627
Braids and bindings	1,707,154	2,396,703	1,559,456	1,350,336	697,938	697,327	1,334,692	1,087,416	1,191,140	1,323,437
Silk and worsted	1,478,252	1,877,522	969,998	727,423	357,800	253,202	180,801	90,786	123,939	174,390
Silk and cotton	7,808,892	6,080,914	5,334,961	4,731,877	4,259,052	3,486,258	3,207,943	4,486,836	5,011,843	4,366,921
Silk and linen	20,892	3,945	2,210	8,547	1,907	1,663	4,008	1,039	2,253	1,644

Table 5 presents by state totals detailed information reported at the Eleventh Census under the general heads of "Capital", "Miscellaneous expenses", "Employés and wages", "Machinery", "Materials used", and "Value of products".

Tables 6 and 7 present the statistics of employés and wages in the various classes.

TABLE 5.—DETAILED STATEMENT FOR THE UNITED STATES, BY STATES: 1890.

STATES.	CAPITAL.									
	Direct investment.									
	Number of establishments.	Value of hired property.	Aggregate.	Value of plant.			Live assets.			
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
The United States.	472	$10,355,160	$51,007,537	$21,086,308	$1,691,660	$5,212,948	$14,181,680	$29,921,229	$6,525,692	$15,879,617	$7,515,920
California	9	99,260	112,283	30,409	.....	.....	30,409	81,874	28,300	15,642	37,932
Connecticut	35	228,841	9,037,042	2,913,327	152,589	1,143,200	1,617,538	6,123,715	1,168,840	3,033,256	1,921,619
Illinois	10	326,164	422,096	199,200	33,000	60,000	106,200	222,896	84,950	39,000	98,946
Maryland	4	33,144	50,400	19,900	6,000	1,500	12,400	30,500	6,400	15,700	8,400
Massachusetts	20	306,542	3,353,296	956,708	77,300	287,500	591,908	2,396,588	277,583	1,019,195	1,099,810
New Jersey	132	2,225,314	16,809,927	7,209,643	590,919	1,579,160	5,039,564	9,600,284	2,110,441	5,892,607	1,597,236
New York	185	5,519,537	11,165,918	4,989,000	544,002	832,240	3,612,758	6,176,918	1,502,202	3,265,119	1,409,597
Ohio	3	11,000	37,830	16,750	10,000	5,000	1,750	21,080	6,800	4,100	10,180
Pennsylvania	66	1,482,231	9,362,063	4,404,181	236,850	1,225,652	2,941,679	4,957,882	1,286,296	2,417,660	1,253,926
Rhode Island	3	108,767	122,256	70,364	.....	.....	70,364	51,892	20,629	15,369	15,894
All other states (a)	5	14,360	534,426	276,826	41,000	78,716	157,110	257,600	33,251	161,969	62,380

STATES.	MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.				
								Aggregates.		Officers, firm members, and clerks.		
	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Average number.	Total wages.	Males above 16 years.	Females above 15 years.	Wages.
The United States.	$4,259,623	$734,268	$156,444	$220,849	$552,818	$661,663	$1,933,581	50 913	$19,680,318	1,396	135	$1,917,877
California	10,438	7,246	397	1,251	661	210	673	214	83,566	7	4	15,276
Connecticut	270,426	21,630	19,799	19,841	73,438	39,783	95,935	5,081	2,006,804	109	8	159,273
Illinois	35,761	17,035	1,885	6,511	5,245	85	5,000	805	295,636	41	8	54,314
Maryland	3,798	2,435	237	211	85	730	100	75	24,233	3	.....	3,600
Massachusetts	484,390	35,838	21,889	12,908	23,676	91,989	298,090	3,216	1,296,399	215	6	258,115
New Jersey	1,356,137	182,148	67,807	67,264	170,074	252,621	616,223	17,917	7,176,180	411	61	541,570
New York	1,123,671	359,777	19,815	63,177	88,594	171,422	420,886	13,151	5,584,399	401	31	601,336
Ohio	2,662	780	595	327	260	.....	700	40	13,685	2	2	2,512
Pennsylvania	939,051	98,089	22,502	46,588	184,449	97,319	490,104	9,522	2,981,334	184	8	256,049
Rhode Island	17,427	7,940	114	629	1,392	1,482	5,870	194	61,978	6	2	8,507
All other states	15,862	1,350	1,404	2,142	4,944	6,022	.....	698	156,104	17	3	17,325

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maine, 1; Michigan, 1; Missouri, 1; North Carolina, 1; Virginia, 1.

TABLE 5.—DETAILED STATEMENT FOR THE UNITED STATES, BY STATES: 1890—Continued.

STATES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.								MACHINERY.						
	Operatives and skilled. (a)				Unskilled.				Number of spindles.			Number of looms.			
												Hand.		Power.	
	Males above 16 years.	Females above 15 years.	Children.	Wages.	Males above 16 years.	Females above 15 years.	Children.	Wages.	Winding, cleaning, and doubling.	Spinning and twisting.	Braiding.	For broad goods.	For narrow goods.	For broad goods.	For ribbons.
The United States	16,718	28,702	2,773	$17,290,315	834	212	93	$472,126	369,035	718,360	167,403	413	1,334	14,866	4,389
California	41	139	2	64,548	8	13	.....	3,742	799	2,018	29	.....	35	.....	1
Connecticut	1,331	3,186	123	1,716,659	209	115	.....	130,872	45,402	84,262	11,492	6	.....	1,053	290
Illinois	154	589	10	239,624	3	.....	.....	1,698	363	369	221	.....	82	.....	.....
Maryland	27	44	.....	20,568	1	.....	.....	65	6	.....	.....	.....	.....	.....	14
Massachusetts	892	1,927	56	993,400	85	1	32	44,884	26,235	55,200	30,403	41	55	354	.....
New Jersey	7,460	8,763	894	6,481,155	313	10	5	153,455	135,160	224,204	19,366	218	19	9,146	2,112
New York	4,393	7,920	264	4,903,590	150	63	16	79,473	62,197	92,772	72,635	80	972	1,838	1,478
Ohio	8	28	.....	11,173	.....	.....	.....	.....	96	.....	.....	8	8	.....	.....
Pennsylvania	2,318	5,607	1,254	2,671,333	102	10	39	53,952	89,429	228,786	30,217	60	163	2,306	451
Rhode Island	46	107	29	52,357	3	.....	1	1,114	930	2,463	40	.....	.....	.....	43
All other states	135	392	141	135,908	10	.....	.....	2,871	8,418	28,286	3,000	.....	.....	169	.....

STATES.	MACHINERY—continued.				MATERIALS USED.									
	Number of machines.				Total cost.	Raw silk.		Waste silk.		Organzine and tram.		Other silk materials.	
	Jacquard.	Knitting.	Lace.	Sewing.		Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
The United States	5,905	245	78	1,032	$51,004,425	6,376,881	$26,087,371	1,357,618	$1,106,608	3,305,372	$16,518,979	744,223	$2,638,242
California	3	5	1	3	146,406	20,575	71,012	200	500	3,718	31,326	3,071	20,568
Connecticut	230	1	.....	16	6,201,876	1,142,802	4,560,968	648,823	515,738	113,978	584,442	15,527	62,180
Illinois	6	10	.....	3	314,855	5,225	23,500	.....	.....	7,095	34,776	21,798	97,655
Maryland	.....	.....	.....	.....	34,305	.....	.....	.....	.....	4,645	27,705	350	1,825
Massachusetts	42	68	.....	11	3,251,893	558,493	2,128,772	191,909	155,494	97,278	485,995	23,608	91,436
New Jersey	4,195	1	3	187	17,908,883	1,845,242	7,691,253	61,420	56,523	1,858,517	9,093,692	97,793	350,377
New York	846	139	74	712	10,174,818	715,003	3,117,515	59,598	57,003	912,782	4,680,369	159,138	716,394
Ohio	.....	.....	.....	.....	13,983	.....	.....	.....	.....	920	7,473	112	862
Pennsylvania	540	20	.....	100	12,094,389	1,932,396	7,843,624	310,668	250,457	287,159	1,484,599	422,826	1,296,945
Rhode Island	43	1	.....	.....	149,763	.....	.....	73,000	58,413	19,280	88,602	.....	.....
All other states	.....	.....	.....	.....	713,254	157,145	650,727	12,000	12,480	.....	.....	.....	.....

STATES.	MATERIALS USED—continued.												
	Other textile materials		Oil.		Soap.		Chemicals and dyestuffs.	Fuel.				Rent of power and heat.	All other materials.
								Total cost.	Coal.	Wood.	Other fuel.		
	Pounds.	Cost.	Gallons.	Cost.	Pounds.	Cost.	Cost.		Cost.	Cost.	Cost.	Cost.	Cost.
The United States	5,624,980	$2,327,684	76,348	$32,514	2,340,098	$126,065	$558,532	$400,107	$372,916	$11,353	$15,838	$85,409	$1,122,914
California	16,920	13,303	94	59	2,900	249	150	102	30	.....	72	1,734	7,403
Connecticut	118,474	78,485	6,977	3,173	589,827	31,055	170,636	73,134	68,382	3,260	1,492	3,400	118,665
Illinois	274,135	111,978	182	107	400	20	4,600	1,725	1,485	.....	240	1,740	38,754
Maryland	7,800	2,799	20	6	.....	.....	.....	205	205	.....	.....	.....	1,765
Massachusetts	212,357	156,120	3,430	1,104	333,724	17,847	51,025	48,149	41,524	6,575	50	870	115,081
New Jersey	314,050	228,811	25,103	10,666	682,315	32,994	111,990	143,132	143,128	.....	4	33,453	155,992
New York	2,176,847	936,248	10,354	4,611	220,554	13,042	100,082	63,990	50,945	65	12,980	33,739	451,825
Ohio	7,975	5,488	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	160
Pennsylvania	2,495,909	794,350	29,223	12,429	297,744	16,906	108,012	63,502	62,372	130	1,000	9,473	214,092
Rhode Island	.....	.....	.....	.....	16,650	998	.....	.....	.....	.....	.....	1,000	750
All other states	493	102	965	359	195,984	12,954	12,037	6,168	4,845	1,323	.....	.....	18,427

a Includes pieceworkers and their wages.

TABLE 5.—DETAILED STATEMENT FOR THE UNITED STATES, BY STATES: 1890—Continued.

STATES.	VALUE OF PRODUCTS.							
	Total.	Organzine and tram.	Spun silk yarn.	Machine twist and sewing silk.	Fringe knitting, embroidery, and floss silk.	Dress goods, figured and plain.	Other broad goods.	Tapestries, curtains, and other upholstery broad goods.
The United States	$87,298,454	$16,889,366	$1,263,489	$7,068,213	$1,849,631	$15,183,134	$9,000,418	$3,712,332
California	271,912	5,600	.....	81,590	24,840	.....	.....	.....
Connecticut	9,788,951	1,356,854	308,536	3,820,463	704,945	1,099,284	1,384,619	62,163
Illinois	785,845	.....	.....	.....	.....	.....	.....	2,000
Maryland	100,361	.....	.....	.....	.....	.....	.....	.....
Massachusetts	5,557,569	688,359	257,251	2,216,213	499,131	.....	784,719	.....
New Jersey	30,760,371	5,265,389	89,000	102,750	119,956	9,297,792	3,517,343	572,842
New York	19,417,796	1,474,841	206,640	254,000	21,259	2,592,508	679,356	665,604
Ohio	33,927	.....	.....	.....	.....	.....	.....	.....
Pennsylvania	19,357,546	7,645,323	308,000	446,197	389,500	1,940,836	2,634,381	2,409,728
Rhode Island	229,062	.....	94,062	.....	.....	.....	.....	.....
All other states	995,114	444,000	.....	147,000	90,000	252,714	.....	.....

STATES.	VALUE OF PRODUCTS—continued.						
	Gimps and trimmings.	Handkerchiefs.	Ribbons and laces.	Braids and bindings.	Dress, cloak, and military trimmings.	Hosiery and knit goods.	All other products.
The United States	$3,918,209	$1,913,224	$17,343,197	$2,771,382	$4,636,357	$1,156,172	$602,330
California	120,360	.....	.....	6,000	23,840	7,346	2,336
Connecticut	112,319	31,300	736,642	139,216	.....	15,125	17,485
Illinois	465,500	.....	.....	65,000	228,745	23,900	700
Maryland	24,000	.....	70,361	.....	6,000	.....	.....
Massachusetts	127,000	.....	.....	660,938	160,000	135,958	28,000
New Jersey	185,949	1,872,559	9,229,387	359,902	54,000	79,212	14,290
New York	1,984,531	9,365	6,031,576	1,154,326	3,199,709	872,800	271,281
Ohio	8,767	.....	.....	.....	25,160	.....	.....
Pennsylvania	889,783	.....	1,195,231	293,000	938,903	21,831	244,838
Rhode Island	.....	.....	80,000	55,000	.....	.....	.....
All other states	.....	.....	.....	38,000	.....	.....	23,400

TABLE 6.—CLASSIFICATION OF EMPLOYÉS AND WAGES FOR THE UNITED STATES, BY STATES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. (a)

STATES	Number of establishments.	Aggregates.		Officers or firm members actively engaged in the industry or in supervision.							Clerks.			
				Males above 16 years.				Females above 15 years.			Males above 16 years.			
		Average number.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.
The United States	472	50,913	$19,680,318	644	49	$36.37	$1,137,043	21	48	$17.80	$17,836	752	49	$19.39	$715,192
California	9	214	83,566	6	50	36.73	11,020	1	50	30.00	1,500	1	44	35.66	1,560
Connecticut	35	5,081	2,006,804	48	50	36.66	87,800	.....	.....	.....	.....	61	50	22.33	68,095
Illinois	10	805	295,636	19	48	31.92	29,060	.....	.....	.....	.....	22	47	20.51	21,324
Maryland	4	75	24,233	3	50	24.00	3,600	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts	20	3,216	1,296,399	44	49	46.28	99,950	1	46	21.82	1,000	171	50	18.13	153,665
New Jersey	132	17,917	7,176,180	201	49	33.57	330,814	3	50	20.00	3,000	210	49	18.55	189,828
New York	185	13,151	5,584,399	220	49	36.82	394,758	13	47	14.99	9,120	181	49	20.65	184,454
Ohio	3	40	13,685	1	50	20.00	1,000	.....	.....	.....	.....	1	50	12.00	600
Pennsylvania	66	9,522	2,981,334	88	46	40.17	163,066	3	49	21.74	3,216	96	48	18.97	87,677
Rhode Island	3	194	61,978	6	49	26.31	7,675	.....	.....	.....	.....	.....	.....	.....	.....
All other states (b)	5	698	156,104	8	46	22.45	8,300	.....	.....	.....	.....	9	49	18.26	7,989

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

STATES.	Clerks—Continued.				Operatives and skilled.							
	Females above 15 years.				Males above 16 years.				Females above 15 years.			
	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.
The United States	114	48	$8.71	$47,806	10,594	49	$11.35	$5,847,457	19,695	48	$5.73	$5,475,613
California	3	46	8.70	1,196	39	47	13.12	24,266	137	48	5.67	37,318
Connecticut	8	50	8.45	3,378	986	50	12.03	592,705	2,499	50	5.60	700,109
Illinois	8	43	11.50	3,930	136	44	11.88	70,522	535	46	5.88	143,392
Maryland	.....	.....	.....	.....	27	50	8.96	11,980	44	50	3.93	8,588
Massachusetts	7	50	10.00	3,500	808	50	9.97	399,194	1,549	49	5.54	424,363
New Jersey	58	49	6.27	17,928	3,697	48	11.36	2,016,165	5,951	47	6.39	1,798,250
New York	18	47	15.41	13,004	2,965	49	12.80	1,865,914	4,825	49	5.88	1,398,208
Ohio	2	47	9.73	912	8	47	9.68	3,649	28	48	5.64	7,524
Pennsylvania	5	47	8.96	2,090	1,777	48	9.23	792,477	3,767	48	4.93	898,188
Rhode Island	2	46	9.08	832	41	50	9.84	20,006	54	48	5.13	13,427
All other states	3	47	7.31	1,036	110	49	9.42	50,579	306	48	3.16	46,237

a The average weekly earnings per employé are computed from individual reports. The average number of employés reported by each establishment is multiplied by the number of weeks embraced by the term of operation; the result is the number of weeks required for one employé to perform the labor. Aggregating such results of individual reports the number of weeks required for one employé to perform the labor is obtained. This number used as a divisor for the total wages produces the true average weekly earnings.

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maine, 1; Michigan, 1; Missouri, 1; North Carolina, 1; Virginia, 1.

TABLE 6.—CLASSIFICATION OF EMPLOYÉS AND WAGES FOR THE UNITED STATES, BY STATES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

STATES.	Operatives and skilled—Continued. Children. Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Unskilled. Males above 16 years. Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Females above 15 years. Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.
The United States	2,573	49	$3.09	$390,029	884	49	$9.38	$406,657	212	48	$4.70	$48,177
California	2	50	4.70	470	8	17	10.50	1,454	13	27	6.64	2,289
Connecticut	123	50	3.91	24,076	209	50	10.20	106,575	115	50	4.23	24,297
Illinois	10	48	3.26	1,560	3	49	11.48	1,698	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	1	10	6.25	65	.....	.....	.....	.....
Massachusetts	48	49	4.31	10,075	85	50	8.75	37,064	1	44	6.86	300
New Jersey	858	49	3.07	128,973	313	49	9.73	149,663	10	50	6.37	3,186
New York	249	49	3.10	37,500	150	49	8.22	60,877	63	49	4.99	15,562
Ohio	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania	1,124	49	3.10	171,220	102	48	9.22	45,432	10	48	5.32	2,544
Rhode Island	18	50	3.11	2,796	3	49	6.57	958	.....	.....	.....	.....
All other states	141	49	1.95	13,359	10	50	5.74	2,871	.....	.....	.....	.....

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

PIECEWORKERS—AVERAGE NUMBER EMPLOYED AND TOTAL WAGES.

STATES.	Unskilled—Continued. Children. Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Summary. Number.	Wages.	Males above 16 years. Number.	Wages.	Females above 15 years. Number.	Wages.	Children. Number.	Wages.
The United States	93	49	$3.78	$17,292	15,331	$5,577,216	6,124	$3,095,417	9,007	$2,446,275	200	$35,524
California	.....	.....	.....	.....	4	2,494	2	1,870	2	624	.....	.....
Connecticut	.....	.....	.....	.....	1,032	399,769	345	197,740	687	202,029	.....	.....
Illinois	.....	.....	.....	.....	72	24,150	18	10,110	54	14,040	.....	.....
Maryland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts	32	50	4.70	7,520	470	159,768	84	49,155	378	109,038	8	1,575
New Jersey	5	50	2.42	606	6,611	2,537,758	3,763	1,663,655	2,812	862,160	36	11,943
New York	16	50	3.79	3,034	4,451	1,601,968	1,341	846,287	3,095	753,806	15	1,875
Ohio	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania	39	48	3.19	5,976	2,511	809,448	541	317,327	1,840	474,300	130	17,821
Rhode Island	1	46	3.40	156	69	16,128	5	1,434	53	12,384	11	2,310
All other states	.....	.....	.....	.....	111	25,733	25	7,839	86	17,894	.....	.....

TABLE 7.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY, FOR THE UNITED STATES, BY STATES: 1890.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)

STATES.	Number of establishments.	Aggregates.		Males above 16 years.								
		Average number.	Total wages.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.
The United States.	472	50,913	$19,680,318	12,874	1,308	473	870	669	688	1,342	1,593	2,175
California	9	214	83,566	54	3	4		4			12	8
Connecticut	35	5,081	2,006,804	1,304	44	49	87	113	64	281	153	192
Illinois	10	805	295,636	180	16		2			32	36	27
Maryland	4	75	24,233	31	1	7	10	1				10
Massachusetts	20	3,216	1,296,399	1,108	63	80	136	82	35	110	66	252
New Jersey	132	17,917	7,176,180	4,421	268	177	317	270	257	512	679	737
New York	185	13,151	5,584,319	3,516	351	111	138	89	214	160	453	605
Ohio	3	40	13,685	10	3						3	2
Pennsylvania	66	9,522	2,981,334	2,063	539	41	143	80	100	247	172	316
Rhode Island	3	194	61,978	50	6		14	7			2	10
All other states (b)	5	698	156,104	137	12	4	23	23	18		17	16

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

STATES.	Males above 16 years—Continued.			Females above 15 years.								
	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.
The United States.	2,151	688	917	20,042	6,523	5,072	4,376	1,371	995	485	885	263
California	13	3	7	154	26	63	29	16	8	7	4	
Connecticut	166	57	98	2,622	529	948	975	75	29	45	7	9
Illinois	29	25	13	543	116	186	175	4	54	1	6	
Maryland			2	44	39		5					
Massachusetts	175	62	47	1,558	364	682	300	95	22	30	13	51
New Jersey	677	274	253	6,022	1,370	1,526	1,487	505	284	254	483	102
New York	846	175	372	4,919	1,493	1,109	951	455	544	122	102	95
Ohio	1	1		30	10	2	15	2				1
Pennsylvania	233	78	114	3,785	2,280	531	407	212	53	24	269	4
Rhode Island	3	3	5	56	25	24		5		2		
All other states	8	10	6	309	271	1	32	2	1		1	1

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

STATES.	Females above 15 years—Continued.			Children.					PIECEWORKERS.	
	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	Average number.	Total wages.
The United States.	37	21	14	2,666	2,561	105				15,331	$5,577,216
California			1	2	1	1				4	2,494
Connecticut	1	2	2	123	121	2				1,032	399,769
Illinois			1	10	10					72	24,150
Maryland											
Massachusetts		1		80	67	13				470	159,768
New Jersey	5	5	1	863	801	62				6,611	2,537,758
New York	30	11	7	265	260	5				4,451	1,601,968
Ohio											
Pennsylvania	1	2	2	1,163	1,141	22				2,511	809,448
Rhode Island				19	19					69	16,128
All other states				141	141					111	25,733

a In comparing the table of weekly rates and the number of employés at each rate with the average weekly earnings presented in Table 6 it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés at the respective rates.

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maine, 1; Michigan, 1; Missouri, 1; North Carolina, 1; Virginia, 1.

DYEING AND FINISHING TEXTILES.

BY P. T. WOOD.

The dyeing and finishing of textiles are integral parts of the manufacture of textile fabrics.

The tables exhibited in this report do not embrace the statistics of establishments connected with cotton, woolen, or silk factories, but show only the operations of independent dye works, bleacheries, and print works, the value of the products reported being merely the values added to the fabrics by the processes of dyeing and finishing. Much of the dyeing and finishing is done by the manufacturers themselves, the data showing that while chemicals and dyestuffs to the value of $8,407,693 were consumed during the census year in the establishments devoted exclusively to this industry, the silk, cotton, and woolen mills in which dyeing and finishing is done used chemicals and dyestuffs valued at $11,278,970, divided as follows: in woolen mills, $6,453,665; in cotton mills, $4,266,773, and in silk mills, $558,532. It will thus be seen that more dyeing and finishing was done in textile mills than in the 248 establishments devoted exclusively to this industry.

While there was an increase in all the expenses in the census year over those reported at the census of 1880, the returns show that the value of the work done in the dyehouses, bleacheries, and print works has decreased. Thus, while there were 248 establishments engaged in this industry in 1890 and 191 in 1880, an increase of 29.84 per cent, the value of the work done during the census year (1890) was $28,900,560, as compared with $32,297,420 in 1880, a decrease of $3,396,860, or 10.52 per cent. This decrease is all the more marked because of the increase in the products of the silk, cotton, and woolen mills during the decade. At the same time a marked increase is shown in the amount paid for wages, a slight difference in cost of materials, and an apparently large increase in the amount of capital invested. The capital employed (not including $1,819,779 value of property hired) in the industry of dyeing and finishing textiles for 1890 was $38,450,800, an apparent but not an actual increase of $12,226,819 over that employed as reported at the census of 1880. The large increase shown in this item is partly due to the fact that invested capital as returned at the census of 1880 did not take cognizance of all the items that are properly embraced by "Live assets", which, it is believed, were for the first time fully reported at the census of 1890. Hence, in making comparison between the returns of capital invested at the two censuses, these facts should be carefully borne in mind.

Dyers and finishers explain that the decrease in value of the work done as reported for 1890 is due to the fact that competition and improved processes have reduced their charges for work at least 25 per cent. The market cost of chemicals and dyestuffs remains about the same, but it is not necessary to use as much of these articles now in a given quantity of goods as was employed at the census of 1880. This is particularly noticeable in the manufactures of silk, as by the introduction of machinery operated by power it is now possible to do work that ten years ago could only be performed by hand. Therefore the decrease in the value of work done is not due to an increase in the number of manufacturers of textiles doing their own dyeing and finishing, since the proportion of such manufacturers in 1890 is about the same as in 1880.

Notwithstanding the decrease in amount received for work done in the dyehouses an average increase is shown in the wages paid. In 1880 there were 16,698 employés, receiving $6,474,364 in wages, while 20,267 employés earned $9,717,011 in wages during the census year ended May 31, 1890. The percentage of increase in the number of employés is 21.37 and in wages paid 50.08.

At the census of 1880 the cost of materials and wages was $20,138,659 as compared with a product of $32,297,420, while at the census of 1890 the cost of these two principal items was $22,102,231 and value of product $28,900,560. Thus materials and wages cost 62.35 per cent of the value of work done in the former census year, while at the latter census the percentage had risen to 76.48.

The work done, both in quantity and value, is principally in dyeing, bleaching, and printing cotton yarns and piece goods.

The amount of $28,900,560, given as value of product of dyehouses, bleacheries, and print works, does not show the full value added to textile manufactures by these processes. In the woolen mills chemicals and dyestuffs costing $6,453,665 were used. From the returns made by manufacturers it is found that the cost of these materials is 36.18 per cent of the added value. Applying this basis of computation, it would appear that the added value of work done in woolen mills is $17,837,659. Chemicals and dyestuffs costing $4,266,773 were used in cotton mills. The cost of these chemicals and dyestuffs, according to the returns of establishments dyeing, printing, and bleaching cotton goods, is 26.61 per cent of the value added by these processes, which would make the value of the work done $16,034,472. In silk mills the chemicals and dyestuffs cost 37.21 per cent of the value added by their use. The cost of these materials is $558,532, and the value of the work done, which means the cost of the dyestuffs plus the value added by their use, is $1,501,027. The value of this work done in mills engaged in textile manufactures is therefore approximately as follows: cotton, $16,034,472; woolen, $17,837,659; silk, $1,501,027; total, $35,373,158. Adding this total to the value of work done in establishments devoted exclusively to dyeing and finishing textiles, the gross value added by dyeing, bleaching, and printing is shown to be $64,273,718.

Table 1 shows by states, with totals for the United States, the number of establishments, amount of capital, miscellaneous expenses, number of employés by classes and their wages, power, cost of materials used, total value of work done, and classes of goods operated upon.

TABLE 1.—DYEING AND FINISHING TEXTILES, IN THE AGGREGATE, SHOWING CAPITAL INVESTED, MISCELLANEOUS EXPENSES, EMPLOYÉS, WAGES, POWER, MATERIALS, AND WORK DONE.

STATES.	Number of establishments.	CAPITAL.								
		Direct investment.								
		Value of hired property.	Value of plant.				Live assets.			
			Aggregate.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
The United States.	248	$1,819,779	$38,450,800	$19,879,039	$2,579,114	$7,596,641	$9,703,284	$18,571,761	$3,586,358	$7,213,281	$7,772,122
Connecticut	5	.....	775,352	621,096	58,700	331,184	231,212	154,256	61,864	4,300	88,092
Illinois	3	13,000	26,500	20,500	3,500	6,000	11,000	6,000	2,000	1,000	3,000
Massachusetts	33	139,500	11,996,154	5,187,513	673,931	2,010,687	2,502,895	6,808,641	717,428	2,773,877	3,317,336
New Jersey	41	306,300	5,197,403	2,996,209	333,936	879,577	1,782,696	2,201,194	442,430	713,993	1,044,771
New York	49	516,866	4,963,095	2,225,566	366,300	721,700	1,137,566	2,737,529	1,148,419	1,358,789	230,321
Pennsylvania	83	247,625	6,296,340	3,791,968	598,647	1,354,200	1,839,121	2,504,372	372,193	918,148	1,214,031
Rhode Island	22	578,788	5,739,692	3,763,321	432,600	1,832,398	1,498,322	1,976,371	491,809	621,048	863,514
All other states (a)	12	17,700	3,456,264	1,272,866	111,500	460,895	700,471	2,183,398	350,215	822,126	1,011,057

STATES.	MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.				
								Aggregates.		Officers, firm members, and clerks.		
	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.	Average number.	Total wages.	Males above 16 years.	Females above 15 years.	Wages.
The United States.	$3,131,081	$168,646	$214,464	$158,996	$866,211	$697,503	$1,025,261	20,267	$9,717,011	636	30	$805,291
Connecticut	77,336	.....	7,618	2,443	35,851	5,785	25,639	489	251,352	12	.....	14,250
Illinois	1,426	920	61	120	125	.....	200	21	10,424	4	1	2,532
Massachusetts	869,669	23,530	82,524	32,675	251,799	250,013	229,128	4,352	1,909,107	78	4	99,320
New Jersey	752,461	38,267	23,507	23,471	145,834	136,041	385,341	3,864	2,057,562	129	.....	179,425
New York	367,935	42,270	22,947	28,630	95,045	133,667	45,376	2,839	1,481,723	112	2	137,473
Pennsylvania	419,456	45,343	21,742	37,357	134,325	30,176	150,513	3,545	1,803,822	184	6	207,257
Rhode Island	393,549	17,206	27,982	24,213	113,746	87,761	122,641	3,720	1,593,055	88	13	130,050
All other states	249,249	1,110	28,083	10,087	89,486	54,060	66,423	1,437	609,966	29	4	34,975

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Delaware, 1; Iowa, 1; Maine, 1; Maryland, 2; Minnesota, 1; Missouri, 1; New Hampshire, 2; Ohio, 2; West Virginia, 1.

TABLE 1.—DYEING AND FINISHING TEXTILES, IN THE AGGREGATE, ETC.—Continued.

STATES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.								POWER.								
	Operatives and skilled. (a)				Unskilled.				Steam.			Water.				All other power.		Printing machines.
	Males above 16 years.	Females above 15 years.	Children.	Wages.	Males above 16 years.	Females above 15 years.	Children.	Wages.	Boilers.	Engines.	Horse power.	Water wheels.		Turbine wheels.		Motors.	Horse power.	
												Number.	Horse power.	Number.	Horse power.			
The United States	14,697	2,178	711	$8,186,947	1,813	129	82	$724,773	927	1,011	54,370	11	630	30	2,397	4	45.5	287
Connecticut	368	72	2	223,064	22	13	.....	14,038	14	13	725	5	350	4	111	.....	.....	4
Illinois	12	3	.....	7,392	1	.....	.....	500	3	3	57	.....	.....	.....	.....	.....	.....	.....
Massachusetts	3,164	516	197	1,668,627	363	23	7	141,160	202	132	11,533	3	160	7	663	1	5.0	77
New Jersey	2,976	346	35	1,744,466	359	.....	19	133,671	139	199	7,005	1	20	3	335	1	10.0	56
New York	1,973	390	121	1,250,774	201	25	15	93,476	156	186	12,545	.....	.....	5	225	.....	.....	70
Pennsylvania	2,590	211	164	1,446,157	374	1	15	150,408	226	259	8,663	1	70	.....	.....	.....	.....	17
Rhode Island	2,518	513	119	1,308,696	386	57	26	154,300	135	182	10,535	1	30	4	258	.....	.....	44
All other states	1,096	127	73	537,771	107	1	.....	37,220	52	37	3,307	.....	.....	7	805	2	30.5	19

STATES.	MATERIALS USED.								WORK DONE.		
	Total cost.	Chemicals and dyestuffs.	Starch.		Soap.		Fuel.	Rent of power and heat.	All other materials.	Total value of work done.	Woolen yarns dyed.	
		Cost.	Pounds.	Cost.	Pounds.	Cost.	Cost.	Cost.	Cost.		Pounds.	Value.
The United States	$12,385,220	$8,407,693	18,649,606	$660,577	6,766,696	$279,272	$1,647,848	$23,138	$1,366,692	$28,900,560	17,999,651	$751,801
Connecticut	300,360	114,126	556,763	17,815	32,318	2,049	58,711	.....	107,659	715,388	.....	.....
Illinois	6,846	4,270	.....	.....	8,200	504	1,072	.....	1,000	26,741	1,031	206
Massachusetts	2,801,364	1,950,550	4,538,183	125,288	753,860	25,599	404,778	6,413	288,736	6,496,215	102,400	9,800
New Jersey	2,711,121	2,068,192	3,184,240	109,466	1,730,738	83,775	239,329	2,500	207,859	6,183,397	138,926	6,043
New York	1,454,119	889,577	2,242,012	73,836	995,683	44,321	216,618	4,775	224,992	3,636,051	459,700	69,352
Pennsylvania	2,395,482	1,808,041	3,517,503	107,269	2,160,788	80,793	284,546	6,250	108,583	5,240,761	b17,216,404	660,657
Rhode Island	1,819,351	1,064,475	3,138,601	129,050	809,774	32,205	351,521	1,200	240,900	4,743,561	29,190	2,543
All other states	896,577	508,462	1,472,304	97,853	275,335	10,026	91,273	2,000	186,963	1,858,446	52,000	3,209

STATES.	WORK DONE—continued.											
	Worsted yarns dyed.		Cotton yarns dyed.		Spun silk yarns dyed.		Thrown silk dyed.		Wool stock dyed.		Cotton stock dyed.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
The United States	9,342,157	$493,974	48,762,759	$2,036,127	311,830	$119,810	3,322,017	$2,346,387	1,160,666	$48,828	4,676,344	$204,827
Connecticut	.....	.....	110,000	11,500	.....	.....	15,600	15,600	.....	.....	165,000	5,400
Illinois	30,000	3,000	81,720	7,535	10,000	5,000	.....	.....	.....	.....	.....	.....
Massachusetts	500,000	42,500	5,172,909	242,356	.....	.....	.....	.....	280,000	5,600	32,000	4,650
New Jersey	10,615	1,331	1,486,400	27,140	8,400	5,000	2,866,937	2,120,318	75,399	5,770	848,466	28,079
New York	62,000	28,162	871,100	76,368	180,200	85,520	272,815	125,571	125,000	4,500	230,000	7,200
Pennsylvania	8,498,342	398,935	33,499,727	1,346,942	111,730	23,090	166,665	84,898	587,267	25,008	1,525,528	47,446
Rhode Island	241,000	20,030	6,522,037	291,161	1,500	1,200	.....	.....	90,000	7,200	1,875,000	112,000
All other states	200	16	1,018,866	33,125	.....	.....	.....	.....	3,000	750	350	52

a Includes pieceworkers and their wages.

b Includes 400,000 pounds woolens and worsteds.

TABLE 1.—DYEING AND FINISHING TEXTILES, IN THE AGGREGATE, ETC.—Continued.

STATES.	WORK DONE—continued.												
	Wool and worsted piece goods dyed.		Cotton piece goods dyed.		Cotton piece goods bleached.		Cotton piece goods printed.		Silk piece goods dyed.		Mixed textile piece goods dyed.		All other work done.
	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Square yards.	Value.	Value.
The United States	20,779,034	$652,996	446,496,822	$5,671,488	454,357,758	$3,369,940	579,667,368	$10,355,032	7,405,399	$394,777	60,716,250	$2,069,765	$384,806
Connecticut	.....	.....	22,398,076	340,201	33,126,636	242,504	4,358,016	68,192	.....	.....	.....	.....	31,991
Illinois	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,000
Massachusetts	7,685,654	92,853	113,430,837	1,388,927	118,891,995	640,375	184,198,408	3,997,087	60,000	6,000	50,000	5,000	61,067
New Jersey	.....	.....	87,748,170	976,956	25,980,644	216,365	94,862,907	1,625,617	4,705,012	116,378	19,790,000	1,029,400	25,000
New York	1,250,150	25,022	30,177,807	399,593	21,316,000	195,762	94,622,693	1,508,307	2,516,787	269,839	14,295,150	691,015	149,849
Pennsylvania	10,793,880	496,509	93,056,440	1,359,002	*a*8,760,980	175,000	24,187,753	268,206	120,100	1,210	24,167,900	267,225	86,633
Rhode Island	1,002,550	34,964	50,727,100	734,522	192,163,959	1,440,921	140,054,180	2,004,890	.....	.....	2,409,200	75,805	18,325
All other states	46,800	3,650	48,958,392	472,287	54,117,544	459,013	37,383,411	882,733	3,500	1,350	4,000	1,320	950

a Dyed, bleached, and printed.

Table 2 shows by states, with totals for the United States, the returns of establishments engaged in dyeing and finishing woolen and worsted, cotton, silk, and mixed goods and yarns, respectively.

TABLE 2.—DYEING AND FINISHING TEXTILES, BY CLASSES OF TEXTILES, SHOWING CAPITAL INVESTED, MISCELLANEOUS EXPENSES, EMPLOYÉS, WAGES, POWER, MATERIALS, AND WORK DONE.

WOOLEN AND WORSTED GOODS AND YARNS.

STATES.	Number of establishments.	CAPITAL.		Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (*a*)				
		Value of hired property.	Direct investment.		Aggregates.		Males above 16 years.	Females above 15 years.	Children.
					Average number.	Total wages.			
The United States	39	$228,700	$2,770,837	$152,628	1,543	$1,046,304	1,482	58	3
Massachusetts	3	.....	65,500	3,171	29	15,550	27	2	.....
New Jersey	3	.....	475,667	39,999	340	297,337	338	2	.....
New York	5	96,000	357,550	45,507	322	278,008	322	.....	.....
Pennsylvania	24	113,500	1,157,706	60,914	819	436,541	765	52	2
All other states (*b*)	4	19,200	14,414	3,037	33	18,868	30	2	1

STATES.	POWER.			Printing machines.	COST OF MATERIALS USED.					Total value of work done.
	Steam.	Water.	All other.		Total.	Chemicals and dyestuffs.	Fuel.	Rent of power and heat.	All other materials.	
	Horse power.	Horse power.	Horse power.							
The United States	3,794	103	.....	41	$1,238,507	$1,009,537	$132,215	$1,280	$95,475	$2,790,405
Massachusetts	154	18	.....	.....	11,268	5,875	2,700	.....	2,693	41,252
New Jersey	1,183	85	.....	20	332,039	277,759	30,600	.....	23,680	771,665
New York	1,065	.....	.....	21	290,590	247,360	29,880	.....	13,350	662,425
Pennsylvania	1,357	.....	.....	.....	586,637	463,665	66,615	1,280	55,077	1,261,163
All other states	35	.....	.....	.....	17,973	14,878	2,420	.....	675	53,900

a Includes officers, firm members, and clerks.

b Includes states grouped, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Rhode Island, 3; Missouri, 1.

TABLE 2.—DYEING AND FINISHING TEXTILES, BY CLASSES OF TEXTILES, ETC.—Continued.

COTTON GOODS AND YARNS.

STATES.	CAPITAL. Number of establishments.	Value of hired property.	Direct investment.	Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a) Aggregates. Average number.	Total wages.	Males above 16 years.	Females above 15 years.	Children.
The United States	113	$971,646	$29,164,503	$2,453,329	14,491	$6,440,408	11,894	1,844	753
Connecticut	4	.....	771,652	76,686	483	248,752	396	85	2
Massachusetts	24	133,500	8,868,857	706,604	3,279	1,413,333	2,750	342	187
New Jersey	13	112,500	3,178,430	575,755	2,079	938,166	1,740	267	52
New York	16	50,733	3,959,235	261,064	1,958	874,975	1,472	352	134
Pennsylvania	31	106,125	3,786,021	226,197	1,814	885,952	1,539	102	173
Rhode Island	17	560,788	5,161,676	359,964	3,460	1,480,684	2,784	544	132
All other states (b)	8	8,000	3,438,632	247,059	1,418	598,546	1,213	132	73

STATES.	POWER. Steam. Horse power.	Water. Horse power.	All other. Horse power.	Printing machines.	COST OF MATERIALS USED. Total.	Chemicals and dyestuffs.	Fuel.	Rent of power and heat.	All other materials.	Total value of work done.
The United States	44,708	2,863	35.5	212	$8,363,016	$5,289,783	$1,187,035	$16,083	$1,870,115	$19,876,364
Connecticut	715	440	.....	4	294,120	109,126	58,111	.....	126,883	699,788
Massachusetts	10,454	765	5.0	49	2,195,959	1,573,749	305,671	6,413	310,126	5,264,241
New Jersey	4,845	270	.....	36	1,185,616	752,476	126,147	1,900	305,093	2,878,016
New York	10,654	225	.....	43	953,055	489,263	168,483	300	295,009	2,262,412
Pennsylvania	5,631	70	.....	17	1,230,828	927,971	134,973	4,270	163,614	2,621,107
Rhode Island	9,120	288	.....	44	1,617,197	937,826	303,223	1,200	374,948	4,320,707
All other states	3,289	805	30.5	19	886,241	499,372	90,427	2,000	294,442	1,830,093

SILK GOODS AND YARNS.

STATES.	CAPITAL. Number of establishments.	Value of hired property.	Direct investment.	Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a) Aggregates. Average number.	Total wages.	Males above 16 years.	Females above 15 years.	Children.
The United States	32	$487,933	$1,880,224	$177,933	1,745	$1,013,325	1,639	102	4
New Jersey	24	193,800	1,313,306	123,607	1,292	744,059	1,233	57	2
New York	21	285,133	466,505	47,706	391	230,034	344	45	2
All other states (b)	7	9,000	100,413	6,620	62	39,232	62	.....	.....

STATES.	POWER. Steam. Horse power.	Water. Horse power.	All other. Horse power.	Printing machines.	COST OF MATERIALS USED. Total.	Chemicals and dyestuffs.	Fuel.	Rent of power and heat.	All other materials.	Total value of work done.
The United States	1,513	21	10.0	.....	$1,276,926	$1,092,192	$83,475	$4,675	$96,584	$2,935,101
New Jersey	777	.....	10.0	.....	1,127,346	967,957	70,582	600	68,207	2,333,716
New York	345	.....	.....	.....	111,129	75,012	9,498	4,075	22,544	478,637
All other states	191	21	.....	.....	38,451	29,223	3,395	.....	5,833	122,748

a Includes officers, firm members, and clerks.

b Includes states grouped, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Cotton—Delaware, 1; Iowa, 1; Maine, 1; Maryland, 1; New Hampshire, 2; Ohio, 1; West Virginia, 1. Silk—Pennsylvania, 5; Illinois, 1; Connecticut, 1.

ELECTRIC LIGHTING BY INCANDESCENCE.

THE EDISON LIGHT.—In September, 1878, Mr. Thomas A. Edison began his experiments with a view to the production of an electric incandescent lamp which would have a life sufficient to permit of its commercial use, and in 1879 he completed his first lamp, using a platinum burner; this aroused great interest, but it was soon found that it required absolute uniformity of pressure, and in other respects did not realize his ideal; he, therefore, continued his work and was rewarded October 21, 1879, with the discovery that the difficulties of the case were met by the use of a carbon filament of high resistance in a vacuum.

A commercially successful incandescent lamp was the result. This lamp was patented January 27, 1880, the application having been filed November 14, 1879. A patent on what is commonly known as the multiple-arc system was applied for on February 6, 1880. This patent covered a full and complete system of generating and distributing electric current for light, heat, and power. The Edison 3-wire system was invented in 1882, and patented in March, 1883.

In January, 1880, Mr. Edison publicly exhibited the lights in operation at Menlo Park, New Jersey, where he was then residing and conducting his researches. The plant had a capacity of something over 500 lights, and attracted visitors in large numbers. In January, 1881, The Edison Electric Light Company, which had been organized in October, 1878, during the experiments at Menlo Park, opened an office at No. 65 Fifth avenue, New York city, where an Edison lighting plant was established and kept on view for the accommodation of scientists and the curious. Here, also, were prepared the plans for a central station system for New York city. The manufacture of Edison generating apparatus by the Edison Machine Works, and of Edison lamps by the Edison Lamp Company, was inaugurated in the same year.

The steamer Jeanette (formerly the Pandora) left San Francisco, where she had been refitted by Mr. James Gordon Bennett for arctic exploration by way of Bering straits, July 8, 1879, under the command of Lieutenant George W. De Long, United States navy, with a crew of 31 men. She had been provided, through the generosity of Mr. Edison, with a small dynamo, somewhat less in capacity than the type afterward standardized for twenty-five 16-candle power lamps, and a few lamps which were used to a limited extent. This was one of the first Edison dynamos made for any purpose, and the first which was placed upon a seagoing vessel. It went down with the ill-fated ship in arctic seas.

The first incandescent lamps successfully applied to the permanent lighting of an ocean-going vessel were placed upon the steamship Columbia, of the Oregon Railway and Navigation Company, which was built at Chester, Pennsylvania, and there fitted with four Edison dynamos; three of these dynamos supplied the current for about 120 16-candle power lamps and for a search light of some 4,000 candle power. The fourth dynamo acted as an exciter for the field magnets of the other dynamos. The plant was started May 2, 1880, and the Columbia sailed from New York for Portland, Oregon, via Cape Horn, about May 20, 1880. The plant was described in the Scientific American of May 22. The ship arrived at Portland July 26, and the chief engineer reported that the electric light system had worked with entire satisfaction during the whole trip in all kinds of weather, the ordinary skill of the engine room being sufficient for the management of the dynamos and lamps. The latter were fitted with carbons mostly of paper and a few of oak fiber. These carbons proved short lived and liable to breakage by heavy shocks, and some of the earliest bamboo carbon lamps were placed in the sockets on the arrival of the steamer at Portland. This plant is still in operation substantially in the form first installed.

Early in 1880 the subject of isolated plants had been considered, and the Edison Company for isolated lighting was organized in October, 1881, to control this branch of the business.

The first isolated incandescent plant placed on land for the lighting of a business establishment consisted of one 25-light dynamo in the establishment of Hinds, Ketchum & Co., lithographers, 449 Water street, New York, installed in January, 1881; and the first mill plant was started in the woolen mill of Mr. James Harrison, Newburg, New York, about September 15, 1881. The first hotel lighted was the Blue Mountain house, in the Adirondacks, started in October, 1881. The plant consisted of two 25-light machines, with 230 100-volt and 102 50-volt lamps, of which 125 lamps were operated at one time. Here the first lamp was placed on an elevator car July 12, 1882. The first yacht lighted was that of Mr. James Gordon Bennett, the Namouna, early in 1882. The first theater lighted by an isolated incandescent plant in this country was the Bijou, in Boston; the plant was started December 12, 1882, with 650 lights. The first newspaper office to use the light was the New York Herald, March, 1882. The first theater lighted by electricity from a central station was the City Theater of Brockton, Massachusetts.

Reference has been made to plans formulated for central station work. It was intended to install the first station in New York city, and construction was begun at a site on Pearl street in the summer of 1881. Meanwhile, however, a company had been formed in Appleton, Wisconsin, and a franchise obtained for central station lighting; the work was so expeditiously done that Appleton won the honor of having the first electric central station in operation, the light being turned on August 20, 1882, two weeks ahead of the Pearl street (New York) station. The installation was on a small scale and very crude; the building, of frame, one story high, measured but 15 by 18 feet; the electrical apparatus was one dynamo, with a capacity of between 200 and 300 lights, and was run by water power; voltmeters and ammeters were not furnished, the current being regulated by the appearance of the lamps

in the station building, and in case of "trouble" the station was shut down and all hands proceeded to locate and repair damages. This initial station started while there was as yet no precedent for the lighting of houses, stores, and hotels exclusively by electricity.

The first central station operated with special reference to incandescent lighting on an extended scale was the Pearl street station, installed in 1882 with about 200 lamps connected, supplied by some 50 miles of conductors placed underground. The completeness of the preliminary arrangements for the first comprehensive plant is illustrated by the fact that only on one occasion during the first half dozen years of its existence, and that for about three hours only, was there any failure of this station to supply current.

The station in Sunbury, Pennsylvania, which was completed July 4, 1883, was the first to operate under the Edison 3-wire system. The station building was a small frame structure containing separate rooms for engines, boilers, dynamos, and meters. The electrical equipment consisted of two dynamos having a capacity of about 500 lights, two primitive and unreliable pressure indicators, and 1-ampere meter on the neutral wire. The meters used to measure the current furnished to the individual customers were of the usual Edison electrolytic type.

The second 3-wire station was operated in Shamokin, Pennsylvania, in October, 1883. The building was of brick and relatively much larger and more commodious than any previously constructed for the purpose: the generating apparatus consisted of two dynamos with a total capacity of about 1,500 lights and an extra dynamo for emergencies.

The line construction in Sunbury and Shamokin was all of the overhead kind, but on October 1, 1883, the first underground 3-wire system was put into operation in Brockton, Massachusetts. The station was well adapted to the intended uses and was fitted up with appliances of the most approved form then known to the art. The electrical apparatus consisted of three dynamos with an aggregate capacity of about 1,000 16-candle power lights, although something less than 200 lamps were connected when the station was first started. Few changes in the installation have been found necessary save in the way of providing for extension of business.

The opening of these initial stations operated by the 3-wire system marked a noteworthy advance of the business and the system has been highly successful from the start.

The Edison "municipal system" was invented by Mr. Edison prior to October 2, 1884, and patented October 20, 1885. It was designed for lighting streets, tunnels, caves, mines, and localities remote from the generating station by incandescent lamps; in this system the lamps are placed in series and the potential is raised to a high degree, strictly 1,200 volts, which is applied to each of several circuits connected in multiple arc. The "municipal" lamp is a modification of the ordinary Edison lamp to meet the requirements of the conditions under which it is used, and operates uniformly at a pressure of 1 volt per candle power, with a current of about 3 amperes.

The first plant designed to use this system was installed at Lockport, New York. It was started in March, 1885, followed October 1 in that year by the plant at Portland, Maine, since which date many other plants have been installed in all sections of the country.

THE ALTERNATING CURRENT SYSTEM.—The manufacturing and installing of alternating current plants with transformers was begun in 1886, almost simultaneously, by the Thomson-Houston Electric Company and the Westinghouse Electric Company, and in 1887 a number of plants were in operation using alternating currents for distribution over considerable distances in incandescent lighting. The business of distribution by alternating currents has grown to large proportions since that time and is one of the most extended branches of electric industry.

In this connection it may be stated that probably the first self-exciting alternating current dynamo built in this country was exhibited by Professors Thomson and Houston at the Franklin Institute, Philadelphia, in the winter of 1878–1879. With this dynamo Professor Thomson carried out some experiments with transformers in multiple arc from the mains early in 1879, the transformers having closed iron magnetic circuits, and approximating in this respect the modern types of transformers.

ELECTRIC STREET RAILWAYS.

Electric street railways are the latest development in the evolution of tramways for urban passenger traffic. Horses constituted the original motive power used on such tramways. The principal methods of motive power now in use by street railways, and their relative economy, form the subject of investigation and report by the transportation division of the Census Office, and it is only necessary to state here that nearly one-fifth of the street railway companies in the United States are now operating their lines wholly or in part by electricity. That this development is of quite recent occurrence will be seen by the following data:

In 1884 the Bentley-Knight Company started an experimental electric street railway, used an underground conductor, and operated one car in Cleveland, Ohio. In 1885 the Baltimore Union Passenger Railway Company equipped the Baltimore and Hampden Branch of their road. They operated two miles of single track, commencing with two cars, which were afterward increased to four. They used the Daft system, middle rail conductor and track return.

In February, 1886, the Binghamton Electric Railway Company, Binghamton, New York, was organized and commenced operating a 5-mile road with 10 cars, using the Van Depoele overhead trolley system. Power was furnished by the Binghamton Gas and Electric Company. Motors of 10 and 15 horse power were used, being placed on the platforms of old horse cars. This road is the oldest in this country that has been operated continuously as an electric road since its first trial of electric motive power.

In 1888 the Sprague Company installed an electric equipment to operate the Union Passenger Railway in Richmond, Virginia. They used the overhead trolley wire, operated 13 miles of track, and had 20 cars in operation by the close of the first year.

TABULAR STATEMENTS FOR 1890.

For the purpose of systematic presentation, this report treats of the electrical industries under the following general heads and subdivisions:

Isolated electric lighting and power plants.
Steamboat electric lighting plants.
Central electric lighting and power stations.
- General statement of capital, income, and expenses.
- Details of income and expenses.
- Details relating to power.
- Details relating to incandescent lighting.
- Details relating to arc lighting.
- Voltage and ampereage of lamps.
- Details relating to stationary motor service.
- Classification, by character of power used, of 129 stations outside of New York city.
- Classification, by type of electrical plant, of 129 stations outside of New York city.
- Classification, by type of steam engine used, of 83 stations outside of New York city.
- Analysis of returns by selected groups of central electric stations.
- Street lighting by electric arc lamps.
- Street lighting by electric incandescent lamps.
- Accumulators or storage batteries used with lighting plants.

Electric street railways.
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Uses of electricity in medicine and surgery.
District messenger electrical call service.
Municipal police patrol telegraph service.
Municipal fire alarm telegraph service.

ISOLATED ELECTRIC LIGHTING AND POWER PLANTS.

In the reports of the Tenth Census no mention is made of isolated electric lighting and power plants. It appears from the current inquiry that the first isolated electric lighting plant in the state of New York was installed in 1876. Following this, one plant was installed in 1877, three in 1878, and two in 1879, making seven plants in operation at the beginning of the census year 1880. In effect, however, the entire development of isolated electric lighting and power plants embraced by this report occurred during the decade of 1880–1890. The development is shown in the following table, which states the number of plants installed annually from 1876 to May 31, 1890:

TABLE 1.—ISOLATED ELECTRIC PLANTS.

NUMBER INSTALLED EACH YEAR.

DIVISIONS.	Total.	YEAR.														
		1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	a1890
State of New York	650	1	1	3	2	13	19	18	24	37	48	71	116	89	131	77
City of New York	214	1	1	2	1	6	8	6	8	15	16	21	30	26	41	32
State (exclusive of city)	436	.....	.....	1	1	7	11	12	16	22	32	50	86	63	90	45

a January 1 to May 31, 1890.

Table 2 exhibits the number of plants existing May 31, 1890, their cost when installed, the cost of additions made to the same, the estimated allowance for depreciation, the value in 1890, and the kilowatt capacity. It will be noticed that the allowance for depreciation exceeds the value of additions made. This should not be construed as indicating a short life for electrical apparatus, but rather as showing the reduction in the cost of manufacturing such apparatus in later years. The "cost when installed" is the price when bought. The value reported for 1890 is the amount for which the apparatus could have been replaced at that date.

TABLE 2.—NUMBER AND VALUE OF ISOLATED ELECTRIC PLANTS, MAY 31, 1890.

DIVISIONS.	Number of plants.	Total cost.	Cost when installed.	Cost of additions.	Allowance for depreciation.	Value, 1890.	Kilowatt capacity.
State of New York	650	$3,416,543	$2,978,337	$438,206	$449,219	$2,967,324	16,575.7
City of New York	214	1,715,950	1,578,793	137,157	242,293	1,473,657	7,970.7
State (exclusive of city)	436	1,700,593	1,399,544	301,049	206,926	1,493,667	8,605.0

The following table exhibits data relating to the motive power used, the method of transmitting the power, and the number of dynamos operated:

TABLE 3.—MOTIVE POWER, ISOLATED ELECTRIC PLANTS.

DIVISIONS.	STEAM.						WATER.					
	Independent engines.		Method of transmitting power to dynamos.				Water wheels.		Method of transmitting power to dynamos.			
	Number.	Horse power.	Number of dynamos.	Number belted direct to independent engines.	Number belted to common line shaft.	Number belted to independent line shaft.	Number.	Horse power.	Number of dynamos.	Number belted direct to water wheels.	Number belted to common line shaft.	Number belted to independent line shaft.
State of New York	408	19,852	1,059	599	393	67	10	315	21	5	4	12
City of New York	204	10,843	408	291	101	16	.....	.....	.....	.....	.....	.....
State (exclusive of city)	204	9,009	651	308	292	51	10	315	21	5	4	12

The following table relates to various classes of currents; also lamps and motors operated by such currents. The total number of dynamos of all classes is 1,080, and their total capacity is 16,575.7 kilowatts.

TABLE 4.—CLASSES OF CURRENTS AND LAMPS AND MOTORS OPERATED, ISOLATED ELECTRIC PLANTS.

CONTINUOUS.

DIVISIONS.	CONSTANT VOLTAGE—VARIABLE AMPERAGE.						CONSTANT AMPERAGE—VARIABLE VOLTAGE.						
	Number of dynamos.	Number of incandescent lamps.	Number of arc lamps.	Stationary motors.		Total kilowatt capacity of this class of dynamos.	Number of dynamos.	Number of incandescent lamps.	Number of arc lamps.		Stationary motors.		Total kilowatt capacity of this class of dynamos.
				Number.	Horse power.				Single.	Double.	Number.	Horse power.	
State of New York	823	224,756	530	453	1,135.3	14,167.6	a247	548	3,372	488	6	37	2,315.1
City of New York	312	122,825	289	359	308.0	7,174.6	92	33	979	162	1	2	740.3
State (exclusive of city)	511	101,931	241	94	827.3	6,903.0	155	515	2,393	326	5	35	1,574.8

ALTERNATING.

State of New York	6	3,625	.....	.....	.....	47.3	4	791	.....	.....	.....	.....	45.7
City of New York	2	1,575	.....	.....	.....	36.4	2	376	.....	.....	.....	.....	19.4
State (exclusive of city)	b4	2,050	.....	.....	.....	10.9	2	415	.....	.....	.....	.....	26.3

a Arc dynamos.

b Two of these dynamos are used for the execution of condemned criminals, and are 3 kilowatts capacity each.

The following table relates to that part of the equipment consisting of transformers, accumulators, and stationary motors. Table 6 relates to incandescent lamps in use; Table 7 relates to arc lamps in use, and Table 8 relates to the consumption of carbons.

TABLE 5.—TRANSFORMERS, ACCUMULATORS, AND STATIONARY MOTORS, ISOLATED ELECTRIC PLANTS.

DIVISIONS.	TRANSFORMERS, ALTERNATING CURRENT.		ACCUMULATORS.		STATIONARY MOTORS, CONTINUOUS CURRENT.						MOTORS CONNECTED AT ORIGINAL INSTALLATION OF PLANTS.	
	Number connected.	Number of incandescent lamps connected to transformers.	Number of cells in use.	Number of incandescent lamps connected directly to accumulators.	Total number of motors.	Total horse power.	Constant voltage.		Constant amperage.			
							Number connected.	Horse power.	Number connected.	Horse power.	Number.	Horse power.
State of New York	134	3,340	953	1,356	459	1,172.3	453	1,135.3	6	37	385	1,046.5
City of New York	18	585	531	911	360	310.0	359	308.0	1	2	324	280.0
State (exclusive of city)	116	2,755	422	445	99	862.3	94	827.3	5	35	61	766.5

TABLE 6.—INCANDESCENT LAMPS IN USE, ISOLATED ELECTRIC PLANTS.

DIVISIONS.	Number connected at original installation of plants.	NUMBER IN USE, 1890.			Number required per year for renewals.	Kilowatt capacity required for all incandescent lamps wired.	NUMBER OF LAMPS AT DIFFERENT VOLTAGES.			
		Total.	Connected on incandescent circuits.	Connected on arc circuits.			20 to 40 volts.	40 to 70 volts.	70 to 100 volts.	100 volts and over.
State of New York	188,663	229,720	229,322	398	169,131	11,807.1	365	2,003	27,177	200,175
City of New York	109,480	124,809	124,776	33	99,376	6,330.5	.....	118	7,202	117,489
State (exclusive of city)	79,183	104,911	104,546	365	69,755	5,476.6	365	1,885	19,975	82,686

TABLE 7.—ARC LAMPS IN USE, ISOLATED ELECTRIC PLANTS.

DIVISIONS.	SINGLE LAMPS.				DOUBLE LAMPS, 400 WATTS AND OVER.		Number connected on incandescent lamp circuits.	Total number of lamps in use, 1890.	Kilowatt capacity required for all lamps wired.
	Number connected at original installation of plant.	Number in use, 1890.			Number connected at original installation of plant.	Number in use, 1890.			
		Total.	Number under 400 watts.	Number 400 watts and over.					
State of New York	2,817	3,372	578	2,794	400	488	530	4,390	2,011.0
City of New York	889	979	40	939	115	162	289	1,430	639.6
State (exclusive of city)	1,928	2,393	538	1,855	285	326	241	2,960	1,371.4

TABLE 8.—CONSUMPTION OF CARBONS, ISOLATED ELECTRIC PLANTS.

DIVISIONS.	NUMBER OF CARBONS.		
	Total.	Plain.	Copper coated.
State of New York	1,339,992	440,415	899,577
City of New York	613,341	330,436	282,905
State (exclusive of city)	726,651	109,979	616,672

The following table exhibits the capacity in number of arc lamps of arc lighting plants; the capacity in number of incandescent lamps of incandescent lighting plants, and the capacity in arc and incandescent lamps, respectively, of the composite plants reported. Table 10 exhibits the kilowatt capacity of the various types of plant in comparison with their respective values; Table 11 exhibits the total surplus capacity of all dynamos installed; Table 12 relates to the average capacity of plants and apparatus, and Table 13 exhibits in comparison certain average values for various classes of plants.

TABLE 9.—LIGHTING CAPACITY OF ISOLATED ELECTRIC PLANTS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city)
Arc lighting plants:			
Number of plants	85	29	56
Capacity in arc lamps and equivalents—number of lamps	2,894	998	1,896
Number of arc lamps on arc plants	2,697	961	1,736
Number of incandescent lamps on arc plants	398	a33	365
Equivalent number in arc lamps	123	33	90
Motors—horse power of motors on arc plants	37	2	35
Equivalent numbers in arc lamps	74	4	70
Incandescent lighting plants:			
Number of plants	521	173	348
Capacity in incandescent lamps and equivalents—number of lamps	223,714.4	119,267.6	104,446.8
Number of incandescent lamps on incandescent plants	205,620	116,338	89,282
Number of arc lights on incandescent plants	530	289	241
Equivalent number in incandescent lamps	4,240	2,312	1,928
Motors—horse power of motors on incandescent plants	1,135.3	308.0	827.3
Equivalent number in incandescent lamps	13,854.4	617.6	13,236.8
Composite plants:			
Number of plants	b42	12	b30
Number of arc lamps	1,693	469	1,224
Number of incandescent lamps	24,100	8,471	15,629
Motors—horse power	144.2	9.95	134.25

a Includes some very large incandescent lamps.

b In addition to this number there are 2 plants owned by the state of New York, installed for the purpose of capital punishment; these plants consist of 2 dynamos of 3 kilowatts capacity each, total value $5,868.

TABLE 10.—KILOWATT CAPACITY AND VALUE OF ISOLATED ELECTRIC PLANTS. (a)

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Arc lighting plants:			
Number of plants	85	29	56
Number of arc lamps	2,697	961	1,736
Kilowatt capacity	1,300.6	437.6	863
Value	$271,864	$80,789	$191,075
Incandescent lighting plants:			
Number of plants	521	173	348
Number of incandescent lamps	205,620	116 338	89,282
Kilowatt capacity	12,852.5	6,738.3	6,114.2
Value	$2,263,063	$1,275,402	$987,661
Composite plants:			
Number of plants	a42	12	a30
Total value	$426,529	$117,466	$309,063
Arc lighting			
Number of arc lamps	1,693	469	1,224
Kilowatt capacity	1,014.5	302.7	711.8
Proportionate value	$180,396	$44,737	$135,659
Incandescent lighting:			
Number of incandescent lamps	24,100	8,471	15,629
Kilowatt capacity	1,402.1	492.1	910
Proportionate value	$246,133	$72,729	$173,404

a Not including 2 dynamos of 3 kilowatts capacity each, used for the execution of condemned criminals.

TABLE 11.—SURPLUS DYNAMO CAPACITY OF ISOLATED ELECTRIC PLANTS. (a)

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Total kilowatt capacity of all incandescent dynamos in use	14,254.60	7,230.40	7,024.20
Total kilowatts required for all incandescent lamps and equivalents in use	13,101.90	6,741.70	6,360.20
Surplus dynamo capacity (kilowatts)	1,152.70	488.70	664.00
Percentage of incandescent dynamo capacity not in use	8.09	6.76	9.45
Total kilowatt capacity of all arc dynamos in use	2,315.10	740.30	1,574.80
Total kilowatts required for all arc lamps and equivalents in use	1,890.10	539.50	1,350.60
Surplus dynamo capacity (kilowatts)	425.00	200.80	224.20
Percentage of arc dynamo capacity not in use	18.36	27.12	14.24

a Not including 2 dynamos of 3 kilowatts capacity each, used for the execution of condemned criminals.

TABLE 12.—AVERAGE CAPACITIES OF APPARATUS, ISOLATED ELECTRIC PLANTS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Average horse power per independent engine	48.66	53.15	44.16
Average number of arc lamps per plant (arc and composite plants)	30.39	27.83	31.62
Average kilowatt capacity (arc plants)	15.30	15.09	15.41
Average number of incandescent lamps per plant (incandescent and composite plants)	407.32	674.46	276.58
Average kilowatt capacity (incandescent plants)	24.66	38.95	17.55
Average number of arc lamps per dynamo	16.43	12.80	18.57
Average number of incandescent lamps per dynamo	297.50	404.24	232.25
Average kilowatt capacity per dynamo of all dynamos	15.35	19.54	12.81

TABLE 13.—COMPARISON OF AVERAGE VALUES, ISOLATED ELECTRIC PLANTS.

CHARACTER OF VALUE.	Total for state.	City of New York.	State of New York (exclusive of city).
Average value of plant:			
Per arc plant	$3,198.40	$2,785.83	$3,412.05
Per incandescent plant	4,343.69	7,372.27	2,838.11
Per composite plant	10,155.45	9,788.83	10,302.10
Average value of plant per kilowatt capacity:			
Arc plants, value per kilowatt	209.03	184.62	221.41
Incandescent plants, value per kilowatt	176.08	189.28	161.54
Composite plants, value per kilowatt	176.50	147.79	190.57
Average value of plant per lamp:			
Per arc lamp and equivalents	111.48	106.56	113.49
Per incandescent lamp and equivalents	10.13	10.55	9.67

STEAMBOAT ELECTRIC LIGHTING PLANTS.

There were 57 steamboats reported as having electric lighting plants June 30, 1890. Table 14 shows the construction of these boats, their tonnage, and the nature of their traffic; present value of their electric lighting plants and the characteristics of same; the number of incandescent lamps required for renewals and the number of arc lamp carbons consumed in a year.

TABLE 14.—STEAMBOATS—ELECTRIC LIGHTING PLANTS.

Number reported	57
Construction:	
Number made of iron	23
Number made of steel	13
Number made of wood	19
Number of composite	2
Tonnage	186,846
Nature of traffic:	
Freight	2
Passenger	35
Freight and passenger	20
Value of lighting plants	$135,638
Number of engines for operation of dynamos	62
Horse power of engines	1,132
Dynamos:	
Total number	64
Incandescent lamp dynamos	54
Arc lamp dynamos	10
Kilowatt capacity of all dynamos	517.3
Arc lamps:	
Number of arc lamps	71
Number of arc search lights	8
Incandescent lamps:	
Number of incandescent lamps	6,449
Number of incandescent search lights	2
Number of incandescent lamps required for renewals	4,642
Arc lamp carbons consumed	21,112
Plain	18,712
Coppered	2,400
Arc lamps operated on incandescent circuits	6

CENTRAL ELECTRIC LIGHTING AND POWER STATIONS.

This report includes returns from 10 stations in the city of New York and 129 stations in the state of New York outside of the city of New York, making a total of 139 stations in the state.

In the following tables the figures for the 10 stations in New York city, and for the 129 stations in the state outside of the city, are presented separately, and the figures for the 139 stations in the state, considered as a whole, are presented in a column giving totals.

Table 15 illustrates the origin and growth of central electric lighting and power stations, on the basis of the number of stations installed each year.

TABLE 15.—CENTRAL ELECTRIC STATIONS.

NUMBER INSTALLED EACH YEAR.

DIVISIONS.	Total.	YEAR.									
		1881	1882	1883	1884	1885	1886	1887	1888	1889	a1890
State of New York	139	7	2	3	3	13	14	33	31	25	8
City of New York	10	2	.....	.....	1	.....	1	2	2	2	.....
State (exclusive of city)	129	5	2	3	2	13	13	31	29	23	8

a January 1 to May 31, 1890.

Table 16 shows (1) number of establishments and persons in interest; (2) capital employed, value of hired property, also a statement showing how the capital is invested in fixed and live assets; (3) liabilities, or how the invested capital is owned, under the subheadings of personal investment, investments by gaslight companies, capital stock paid in incorporated electric light and power companies, surplus fund, undivided profits, bonds payable, bills and accounts payable and other credits; (4) income, total, and under the subheads of income from arc and incandescent lighting, electric power service, and sundry sources; (5) operating expenses, shown under the subheads of wages paid, materials used, and miscellaneous expenses not including depreciation of plant.

The statement showing capital investments and liabilities, or how the capital invested is owned, are aggregates of the respective accounts as kept by the companies, firms, or persons reporting, and it may be noted that these accounts show for surplus fund and undivided profits for the 10 stations in New York city $1,592,404; for the 129 stations in the state outside the city of New York $653,949, making a total for the 139 stations in the state of New York of $2,246,353. The fact should be kept clearly in mind that these amounts of surplus fund and undivided profits represent accumulations during the entire time the stations reported have been in operation. They are the balances of these accounts brought forward from year to year, and do not represent net earnings or profits for any single year.

TABLE 16.—STATEMENT OF CAPITAL, INCOME, AND EXPENSES, CENTRAL ELECTRIC STATIONS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Number of establishments (a)	139	10	129
Character of ownership:			
Personal	27	.....	27
Gaslight companies	9	.....	9
Incorporated electric light and power companies	103	10	93
Number of shareholders	3,369	857	2,512
Number residing in state of New York	3,084	751	2,333
Number residing in other states	285	106	179
Number of male shareholders	2,964	788	2,176
Number of female shareholders	405	69	336
Capital:			
Value of hired property	$1,030,355	$633,050	$397,305
Aggregate of direct investment	$30,153,263	$15,995,500	$14,157,763
Plant—total	17,133,011	7,440,531	9,692,480
Land	1,612,017	820,884	791,133
Buildings	1,830,918	703,984	1,126,934
Office fixtures and furniture	32,589	12,614	19,975
Steam or water power plant and its accessories	2,699,778	933,923	1,765,855
Electric plant within station and its accessories	3,095,848	1,069,421	2,026,427
Underground electric service construction	3,043,363	2,457,007	586,356
Aerial electric service construction	2,640,812	713,707	1,927,105
Lamps, motors, meters, and converters wired for use	2,177,686	728,991	1,448,695
Live assets—total	13,020,252	8,554,969	4,465,283
Lamps, globes, carbons, and wire in stock	252,345	95,429	156,916
Motors, meters, and converters in stock	191,275	147,001	44,274
Patent rights	11,076,567	7,642,114	3,434,453
Sundry supplies	132,518	23,522	108,996
Cash, bills receivable, accounts due, and sundries	1,367,547	646,903	720,644
Liabilities—total	30,153,263	15,995,500	14,157,763
Personal investment	603,553	.....	603,553
Investment by gaslight companies	291,353	.....	291,353
Capital stock paid in incorporated electric light and power companies	18,042,811	8,917,800	9,125,011
Surplus fund	1,655,625	1,272,503	383,122
Undivided profits	590,728	319,901	270,827
Bonds payable	6,679,713	4,410,000	2,269,713
Bills and accounts payable and all other credits	2,289,480	1,075,296	1,214,184
Income—total	4,174,534	1,565,074	2,609,460
From arc and incandescent lighting	3,858,206	1,362,595	2,495,613
From power	192,754	125,474	67,280
From sundries	123,572	77,005	46,567
Expenses—total	3,077,625	1,446,330	1,631,295
Wages	1,375,861	662,787	713,074
Materials used	961,636	345,664	635,972
Miscellaneous expenses (b)	720,128	437,879	282,249

a Does not include 1 central station operated by the municipality of Dunkirk, New York.
b Does not include depreciation of plant.

The statement of income and expenses presented in the table on the following page covers the operations of each station for one year, the accounts being made for a period corresponding as nearly as possible with the Eleventh Census year, June 1, 1889, to May 31, 1890. An examination of the statement will disclose the fact that interest on capital invested, depreciation on value of buildings, machinery and line construction, and cost of collecting rentals have not been calculated nor included in any of the items showing cost of operation.

The data presented can not, therefore, be considered as showing net profits or earnings, such a statement not being properly within the scope of this inquiry.

TABLE 17.—INCOME AND EXPENSES IN DETAIL, CENTRAL ELECTRIC STATIONS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Income—aggregate	$4,174,534	$1,565,074	$2,609,460
From arc lighting, single carbon lamps—total receipts	$812,891	$267,563	$545,328
Total number single carbon lamps	8,846	1,880	6,966
Residence lighting, number of lamps	2		2
Annual income	$64		$64
Commercial lighting, number of lamps	6,764	1,880	4,884
Annual income	$634,704	$267,563	$367,141
Municipal lighting, number of lamps	2,080		2,080
Annual income	$178,123		$178,123
From arc lighting, double carbon lamps—total receipts	$1,459,483	$352,412	$1,107,071
Total number of double carbon lamps	10,988	2,039	8,949
Commercial lighting, number of lamps	2,119	1,134	985
Annual income	$317,042	$222,451	$94,591
Municipal lighting, number of lamps	8,869	905	7,964
Annual income	$1,142,441	$129,961	$1,012,480
From incandescent lamp lighting—total receipts	$1,585,834	$742,620	$843,214
Total (theoretical) number of incandescent lamps (*a*)	286,935	123,204	163,731
Residence lighting, number of lamps	16,952		16,952
Annual income	$47,515		$47,515
Commercial lighting, number of lamps	264,037	123,204	140,833
Annual income	$1,474,801	$742,620	$732,181
Municipal lighting, number of lamps	5,946		5,946
Annual income	$63,518		$63,518
From power—total receipts	$192,754	$125,474	$67,280
Number of stationary motors	2,363	1,185	1,178
Horse power	2,954	1,678	1,276
Annual income	$185,205	$125,474	$59,731
Number of electric locomotives	20		20
Horse power	180		180
Annual income	$7,549		$7,549
From sundries—total receipts	$123,572	$77,005	$46,567
Expenses—aggregate	$3,077,625	$1,446,330	$1,631,295
Total wages	$1,375,861	$662,787	$713,074
Average number of employés	1,753	723	1,030
Males above 16 years	1,747	722	1,025
Females above 15 years	6	1	5
Materials used—total cost	$981,636	$345,664	$635,972
Fuel	513,794	168,597	345,197
Water	40,976	15,062	25,914
Incandescent lamp renewals	118,555	48,920	69,635
Arc lamp carbons	108,986	23,975	85,011
Arc lamp globes	12,197	5,028	7,169
Sundry supplies	187,128	84,082	103,046
Miscellaneous expenses—total (*b*)	$720,128	$437,879	$282,249
Rent	80,627	50,644	29,983
Insurance	57,020	27,359	29,661
Taxes	114,502	50,625	63,877
Rentals for poles and other supports	9,132	575	8,557
Rentals for conduits or other underground privileges	174,889	173,970	919
Repairs, ordinary, of buildings and machinery	152,313	47,787	104,526
Contingencies and sundries	131,645	86,919	44,726

a On 16-candle power basis.

b Does not include depreciation of plant.

The following table shows details relating to steam and water power plants, respectively; dynamos and line construction; fuel and arc lamp carbons consumed, and incandescent lamps required for renewals:

TABLE 18.—PLANT AND MATERIALS USED—CENTRAL ELECTRIC STATIONS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Power plant:			
Boilers, number	368	86	282
Horse power capacity	47,895	15,972	31,923
Total horse power capacity of plant, nominal rating	59,512	16,670	42,842
Engines, number	330	61	269
Horse power capacity, nominal rating	47,432	16,670	30,762
Water wheels, number	74	.....	74
Horse power capacity, nominal rating	12,080	.....	12,080
Electric plant in station:			
Dynamos, number	1,264	384	880
Kilowatt capacity of dynamos	31,383	11,798	19,585
Dynamos, continuous current, number	1,074	338	736
Constant voltage, variable ampereage	329	103	226
Variable voltage, constant ampereage	745	235	510
Dynamos, alternating current, number	189	46	143
Constant voltage, variable ampereage	177	46	131
Variable voltage, constant ampereage	12	.....	12
Dynamos of other types, number	1	.....	1
Station instruments in use, number	5,152	1,446	3,706
Line construction:			
Total mileage of all conductors	10,673.6	5,899.9	4,773.7
Conductors, total number	1,358	356	1,002
Underground conductors, number	136	90	46
Mileage of underground conductors	671.1	546.6	124.5
Conductors, part underground, part aerial, number	136	136	.....
Mileage	4,586	4,586	.....
Aerial conductors, number	1,086	130	956
Mileage	5,416.5	767.3	4,649.2
Fuel used:			
Total cost	$513,794	$168,597	$345,197
Anthracite coal, tons used	112,576	52,701	59,875
Cost	$322,941	$143,537	$179,404
Semibituminous coal, tons used	3,070	.....	3,070
Cost	$5,963	.....	$5,963
Bituminous coal, tons used	64,347	6,950	57,397
Cost	$178,761	$25,060	$153,701
Natural gas, cost	$4,425	.....	$4,425
Other fuel, cost	$1,704	.....	$1,704
Arc lamp carbons:			
Total cost	$108,986	$23,975	$85,011
Total number of carbons consumed	10,417,217	2,282,038	8,135,179
Plain carbons consumed, number	1,491,388	139,894	1,351,494
Coppered carbons consumed, number	8,925,829	2,142,144	6,783,685
Incandescent lamp renewals:			
Total cost	$118,555	$48,920	$69,635
Number	214,137	95,160	118,977

The following table shows details of income from incandescent lighting, based on meter and contract charges and municipal lighting service, the character of currents employed, the system of wiring, also the number of lamps connected of the different candle power:

TABLE 19.—INCANDESCENT LIGHTING IN DETAIL, CENTRAL ELECTRIC STATIONS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Incandescent lighting:			
Incandescent lamps—total number (*a*)	286,935	123,204	163,731
Total income	$1,585,834	$742,620	$843,214
Residence lighting:			
Meter service, number of lamps (*a*)	9,965	.....	9,965
Annual income	$26,627	.....	$26,627
Contract service, number of lamps (*a*)	6,987	.....	6,987
Annual income	$20,888	.....	$20,888
Municipal lighting:			
Contract service, number of lamps (*a*)	5,946	.....	5,946
Annual income	$63,518	.....	$63,518
Commercial lighting:			
Meter service, number of lamps (*a*)	173,279	116,679	56,600
Annual income	$887,330	$694,695	$192,635
Contract service, number of lamps (*a*)	90,758	6,525	84,233
Annual income	$567,471	$47,925	$539,546
Classification of incandescent lamps:			
10 candle power, number of lamps (*b*)	8,806	.....	8,806
16 candle power, number of lamps (*b*)	244,939	122,651	122,288
20 candle power, number of lamps (*b*)	9,724	.....	9,724
24 candle power, number of lamps (*b*)	3,982	.....	3,982
32 candle power, number of lamps (*b*)	4,177	225	3,952
50 candle power, number of lamps (*b*)	1,595	3	1,592
65 candle power, number of lamps (*b*)	278	.....	278
75 candle power, number of lamps (*b*)	28	.....	28
100 candle power, number of lamps (*b*)	274	.....	274
150 candle power, number of lamps (*b*)	219	10	209
Character of current:			
Primary continuous, number of lamps	136,707	69,000	67,707
Primary alternating, number of lamps	3,402	.....	3,402
Secondary alternating, number of lamps	133,913	53,889	80,024
System of wiring:			
Multiple, number of lamps	160,510	58,889	101,621
Series multiple, number of lamps	730	.....	730
Series, number of lamps	1,072	.....	1,072
Multiple series, number of lamps	6,891	.....	6,891
3-wire, number of lamps	103,173	64,000	39,173
On arc lamp circuits, number of lamps	1,646	.....	1,646

a Theoretical number of lamps computed on basis of 16 candle power unit.

b Actual number of lamps classified according to power.

The following table shows details of system for hanging arc lamps used for street lighting, the character of currents, system of wiring, and total number of arc lamps connected:

TABLE 20.—ARC LIGHTING IN DETAIL, CENTRAL ELECTRIC STATIONS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Arc lamp service, street and commercial lighting:			
Single carbon lamps—total number	8,846	1,880	6,966
Character of current:			
Primary continuous	8,769	1,880	6,889
Primary alternating	77		77
System of wiring:			
Series, number of lamps	7,775	1,626	6,149
Multiple, on incandescent lamp circuits, number of lamps	217		217
3-wire, on incandescent lamp circuits, number of lamps	854	254	600
Double carbon lamps—total number	10,988	2,039	8,949
Character of current:			
Primary continuous, number of lamps	10,988	2,039	8,949
Wiring system:			
Series, number of lamps	10,988	2,039	8,949
System for hanging arc lamps for street lighting:			
Single carbon lamps—total number	2,080		2,080
Number on poles	507		507
Number on mast arms	168		168
Number over street center	1,405		1,405
Double carbon lamps, total number	8,869	905	7,964
Number on poles	4,140	892	3,248
Number on mast arms	2,435	13	2,422
Number over street center	2,232		2,232
Number on towers	62		62

The following table shows details of voltage and ampereage of arc lamps and the voltage of incandescent lamps, giving the number of lamps connected on the respective currents, specified by commercial rating:

TABLE 21.—VOLTAGE AND AMPEREAGE OF LAMPS, CENTRAL ELECTRIC STATIONS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Arc lamps:			
Single carbon lamps—total number	8,846	1,880	6,966
20 volts, 23 amperes	16	.....	16
30 volts, 18 amperes	25	25	.....
30 volts, 20 amperes	206	.....	206
45 volts, 6.8 amperes	875	41	834
45 volts, 8 amperes	6	.....	6
45 volts, 9 amperes	30	.....	30
45 volts, 9.6 amperes	832	.....	832
45 volts, 10 amperes	1,418	440	978
46 volts, 6.8 amperes	1,058	.....	1,058
48 volts, 6.8 amperes	61	.....	61
48 volts, 9.6 amperes	30	.....	30
48 volts, 10 amperes	210	.....	210
50 volts, 6.8 amperes	833	.....	833
50 volts, 8 amperes	602	2	600
50 volts, 9 amperes	240	.....	240
50 volts, 9.6 amperes	1,429	1,118	311
50 volts, 10 amperes	673	.....	673
52 volts, 8 amperes	48	.....	48
55 volts, 8 amperes	254	254	.....
Double carbon lamps—total number	10,988	2,039	8,949
25 volts, 20 amperes	368	.....	368
30 volts, 18 amperes	809	809	.....
30 volts, 20 amperes	484	.....	484
35 volts, 22 amperes	85	85	.....
45 volts, 6.8 amperes	381	.....	381
45 volts, 9 amperes	116	.....	116
45 volts, 9.6 amperes	2,415	.....	2,415
45 volts, 10 amperes	1,551	385	1,166
46 volts, 6.8 amperes	1,285	.....	1,285
48 volts, 6.8 amperes	20	.....	20
48 volts, 9.6 amperes	30	.....	30
48 volts, 10 amperes	444	.....	444
50 volts, 6.8 amperes	653	.....	653
50 volts, 9 amperes	220	.....	220
50 volts, 9.6 amperes	1,264	760	504
50 volts, 10 amperes	863	.....	863
Incandescent lamps—total number	274,022	122,889	151,133
Less than 40 volts	4,065	.....	4,065
40 and less than 70 volts	114,102	36,889	77,213
70 and less than 100 volts	9,669	7,000	2,669
100 volts and over	146,186	79,000	67,186

The following table presents details for stationary motor service, showing number of motors and total horse power; income, meter, and contract charges; character of currents; systems of wiring; also the capacity, number, and location of converters connected:

TABLE 22.—DETAILS RELATING TO STATIONARY MOTOR SERVICE, CENTRAL ELECTRIC STATIONS.

ITEMS.	Total for state.	City of New York.	State of New York (exclusive of city).
Stationary motors—total number of motors	2,363	1,185	1,178
Horse power, total	2,954	1,678	1,276
Income—total	$185,205	$125,474	$59,731
Meter charges, number of motors	668	600	68
Annual income	$67,550	$60,000	$7,550
Contract charges, number of motors	1,695	585	1,110
Annual income	$117,655	$65,474	$52,181
Character of current:			
Primary continuous—			
Constant voltage, number of motors	1,428	1,158	270
Constant ampereage, number of motors	901	27	874
Secondary alternating, number of motors	34	.....	34
System of wiring:			
Primary current—number of motors	2,329	1,185	1,144
Multiple, number of motors	669	558	111
Horse power of motors connected	1,456	951	505
Series, number of motors	972	27	945
Horse power of motors connected	512	30	482
3-wire, number of motors connected	688	600	88
Horse power of motors connected	948	697	251
Secondary current:			
Multiple, number of motors connected	34	.....	34
Horse power of motors connected	38	.....	38
Converters:			
Ampereage capacity of all converters connected	129,896	54,200	75,696
Total number converters	7,282	2,544	4,738
5 amperes, number	387	.....	387
10 amperes, number	1,728	1,025	703
15 amperes, number	488	.....	488
20 amperes, number	1,336	760	576
25 amperes, number	338	.....	338
30 amperes, number	686	470	216
40 amperes, number	817	205	612
50 amperes, number	70	52	18
75 amperes, number	68	.....	68
100 amperes, number	30	19	11
150 amperes, number	13	13	.....
Number of street converters	1,321	.....	1,321
Location of converters:			
Number on poles	1,826	.....	1,826
Number outside buildings	5,422	2,544	2,878
Number inside buildings	34	.....	34

In the following table data relating to 129 stations located outside the city of New York are classified by character of power used, and percentages obtained from the totals shown are presented for the respective types of station:

TABLE 23.—CLASSIFICATION, BY CHARACTER OF POWER USED, OF 129 CENTRAL ELECTRIC STATIONS OUTSIDE OF NEW YORK CITY.

ITEMS.	Total.	Steam.	Water.	Steam and water.	Power hired.
Number of stations	129	88	13	13	15
Value of entire plant, direct investment	a$9,736,754	$7,215,445	$1,407,279	$866,182	$247,848
Average value of entire plant per station	$75,479	$81,994	$108,252	$66,629	$16,523
Gross income	$2,609,460	$2,016,012	$306,465	$168,669	$118,314
Gross expense (b)	$1,631,295	$1,310,082	$151,768	$116,083	$53,362
Net operating income (b)	$978,165	$705,930	$154,697	$52,586	$64,952
Value of power plant	$1,765,855	$1,390,099	$194,001	$173,123	$8,632
Average value of power plant per station	$13,689	$15,797	$14,923	$13,317	$575
Expense of power plant	$615,176	$550,909	$8,494	$40,143	$15,630
Wages	$178,171	$161,515	$5,450	$8,012	$3,194
All other expenses	$437,005	$389,394	$3,044	$32,131	$12,436
Power—total horse power	42,842	26,787	9,521	5,699	835
Steam horse power	30,762	26,787	c905	2,685	385
Water horse power	12,080	.....	8,616	3,014	450
Percentage:					
Gross income on value of entire plant	26.80	27.94	21.78	19.47	47.74
Gross expense on value of entire plant	16.75	18.16	10.78	13.40	21.53
Gross expense of gross income	62.51	64.98	49.52	68.82	45.10
Net income on value of entire plant (b)	10.05	9.78	10.99	6.07	26.21
Value of power plant on value of entire plant	18.14	19.27	13.79	19.99	3.48
Labor on power plant of gross expense	10.92	12.33	3.59	6.90	5.99
Incidental power expense of gross expense	26.79	29.72	2.01	27.68	23.30
Total power expense of gross expense	37.71	42.05	5.60	34.58	29.29

a The item "motors, meters, and converters" ($44,274) is included in this amount.

b In this computation charges for depreciation have not been included.

c Stations using water power exclusively have 905 horse power in steam engines installed to be used in case of emergency. There is no record of the use of these engines.

In the following table data relating to 129 stations located outside the city of New York are classified by types of electrical plant, and percentages obtained from the totals shown are presented for the respective groups:

TABLE 24.—CLASSIFICATION, BY TYPE OF ELECTRICAL PLANT, OF 129 CENTRAL STATIONS OUTSIDE OF NEW YORK CITY.

ITEMS.	Total.	Arc.	INCANDESCENT.		COMPOSITE.		
			Continuous current.	Alternating current.	Arc and incandescent.	Arc and series incandescent.	Incandescent with arcs on incandescent circuits.
Number of stations	129	17	8	9	75	15	5
Total value of entire plant, direct investment (a)	$9,736,754	$983,731	$149,326	$211,403	$6,389,268	$829,498	$1,173,528
Total capacity of plant in kilowatts	19,585	1,659.8	565.9	627.7	13,732.5	1,420.1	1,579
Electrical apparatus and lines, value	$5,988,583	$534,044	$95,975	$150,774	$3,954,416	$474,107	$779,267
Income—total	$2,609,460	$276,275	$51,469	$83,421	$1,680,466	$411,440	b$106,389
Arc lighting	1,652,399	268,375			1,006,432	362,642	14,950
Incandescent lighting	843,214		33,961	83,259	603,146	40,637	82,211
Motors	67,280	4,439	1,403		48,862	3,348	9,228
Miscellaneous	46,567	3,461	16,105	162	22,026	4,813	
Operating expenses—total (c)	$1,631,295	$170,123	$37,908	$48,238	$1,069,229	$223,704	$82,093
Electrical plant—							
Office expenses	$141,325	$17,994	$1,512	$4,546	$81,046	$26,887	$8,746
Wages	$452,916	$46,180	$10,950	$9,356	$289,371	$72,084	$24,975
Incidental expenses	$325,257	$37,052	$5,625	$11,644	$210,767	$40,712	$19,457
Percentage:							
Of total value of each type of plant	100.00	10.10	1.54	2.17	65.62	8.52	12.05
Of total income of each type of plant	100.00	10.59	1.97	3.19	64.40	15.77	4.08
Operating expenses of income		61.58	73.65	57.82	63.63	54.37	77.16
Electrical apparatus and lines of total value of plant		54.29	64.27	71.32	61.89	57.16	66.40
Office expenses of total operating expenses		10.58	3.99	9.41	7.64	12.02	10.65
Electrical plant labor of total expense		27.15	28.89	19.40	27.06	32.22	30.42
Electrical plant incidental expense of total expense		21.78	14.84	24.14	19.71	18.20	23.70
Averages:							
Value of plant per station	$75,479	$57,867	$18,666	$23,489	$85,190	$55,300	$234,706
Value of plant per kilowatt of capacity	$497	$593	$264	$337	$465	$584	d$743

a The item "motors, meters, and converters" ($44,274) is included in this amount.
b One large plant had run but one year and its income was not fully developed.
c Does not include depreciation of plant.
d Includes expensive underground conductors.

In the following table are presented certain data reported for 83 central electric lighting and power stations located outside the city of New York and using steam power exclusively. These data are classified according to the speed of the engines furnishing power for dynamos. The distribution is made in two groups: the one using engines running 150 revolutions or more per minute is classed as "fast running", and the other group, using engines running less than 150 revolutions per minute, is classed as "slow running".

TABLE 25.—CLASSIFICATION, BY TYPE OF STEAM ENGINE USED, OF 83 CENTRAL ELECTRIC STATIONS OUTSIDE OF NEW YORK CITY.

ITEMS.	Total.	TYPE OF STEAM ENGINES FURNISHING POWER TO DYNAMOS.	
		Fast running. (a)	Slow running. (b)
Number of stations	83	68	15
Total value of entire plant, direct investment	$7,129,283	$4,209,185	$2,920,098
Steam power plant, value	$1,383,099	$753,172	$629,927
Horse power of engine, nominal rating	26,357	14,405	11,952
Income—total	$1,986,436	$910,308	$1,076,128
Operating expenses (not including depreciation of plant)—total	$1,286,257	$701,467	$584,790
Cost of power—total	$560,662	$338,406	$222,256
Fuel (c)	336,852	215,451	121,401
Wages	159,049	87,793	71,256
Incidental expenses	64,761	35,162	29,599
Percentages:			
Value of steam power plant of value of total plant		17.89	21.57
Operating expense of total income		77.06	54.34
Total cost of power of total expense		48.24	38.01
Fuel of total expense		30.71	20.76
Wages of total expense		12.52	12.19
Incidental expense of total expense		5.01	5.06

a The fast engines are as follows: simple fast, 49; simple condensing fast, 3; compound condensing fast, 7; compound noncondensing fast, 1; simple fast and compound condensing fast, 5; simple fast and compound noncondensing fast, 3.

b The slow engines are as follows: simple condensing slow, 5; compound condensing slow, 1; simple fast and slow, 5; simple fast and compound condensing slow, 4; simple fast, condensing slow compound condensing slow, 2; simple slow, compound condensing fast, 1; condensing slow, noncondensing slow compound noncondensing slow, 1.

c The item of fuel includes 112,676 tons of coal at an average cost of $2.76 per ton delivered at power plant; 68 plants, having a total of 14,405 nominal horse power of "fast-running" engines used 76,044 tons of coal, or 5.28 tons of coal per horse power; 15 plants having a total of 11,952 nominal horse power of "slow-running" engines, used 36,632 tons of coal, or 3.06 tons per horse power.

In the following table the amounts of stock and bond investment are shown, respectively, for all central electric lighting and power stations in the state of New York outside the city of New York; also the gross income, the various sources from which it was derived, and the amount derived from each source, the various expenses of operation, and the respective amounts and their percentage of the total operating expense:

TABLE 26.—INVESTMENT, INCOME, AND OPERATING EXPENSES FOR ALL (129) CENTRAL ELECTRIC STATIONS IN THE STATE OF NEW YORK OUTSIDE THE CITY OF NEW YORK.

ITEMS.	Total.	Per cent of total.
Capital stock and bond investment	$12,289,630	100.00
Individual and share capital stock investment	10,019,917	81.53
Bond investment	2,269,713	18.47
Income	2,609,460	100.00
Arc lighting	1,652,399	63.32
Incandescent lighting	843,214	32.31
Power	67,280	2.58
Sundries	46,567	1.79
Operating expenses, exclusive of depreciation of plant	1,631,295	100.00
Rent of buildings and land	29,983	1.84
Insurance	29,661	1.82
Taxes	63,877	3.92
Wages	713,074	43.71
Fuel	345,197	21.16
Water	25,914	1.59
Incandescent lamp renewals	69,635	4.27
Carbons	85,011	5.21
Globes	7,169	0.44
Rent of poles, etc	8,557	0.52
Rent of conduits	919	0.06
Supplies	207,572	12.72
Contingencies	44,726	2.74

ANALYSIS OF RETURNS FROM SELECTED GROUPS OF CENTRAL ELECTRIC STATIONS.

As a guide to the results of the electrical engineering practices of the day, stations having corresponding characteristics are grouped, and the following table shows their combined capital stock and bond investment, income, operating expense and operating income, the per cent of total income represented by each of the several sources of income, the per cent of total expense represented by each of the various items of expense, the output computed in arc lamp hours, income and expense of each class of service, operating income of each service, and the operating income of each service per arc lamp hour:

TABLE 27.—STATEMENT BY GROUP TOTALS FOR 13 SELECTED COMPOSITE STATIONS AND ANALYSIS OF DATA.

ITEMS.	GROUP I. Ten composite stations using arc lamps 400 watts and over. (a)						GROUP II. Three composite stations using arc lamps less than 400 watts. (b)	
	Combination of six stations using steam power and four stations using water power.		Six stations using steam power.		Four stations using water power.			
	Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.
Capital stock and bond investment	$2,509,680	100.00	$1,619,680	100.00	$890,000	100.00	$1,110,000	100.00
Individual and share capital stock investment	2,054,500	81.86	1,414,500	87.33	640,000	71.91	1,050,000	94.59
Bond investment	455,180	18.14	205,180	12.67	250,000	28.09	60,000	5.41
Total income	640,992	100.00	450,715	100.00	190,277	100.00	433,518	100.00
Arc	511,937	79.87	369,084	81.89	142,853	75.08	411,443	94.91
Incandescent	93,032	14.51	69,429	15.40	23,603	12.40	18,994	4.38
Motor	23,548	3.67	9,009	2.00	14,539	7.64	1,888	0.44
Miscellaneous	12,475	1.95	3,193	0.71	9,282	4.88	1,193	0.27
Total operating expenses exclusive of depreciation of plant	344,994	100.00	251,161	100.00	93,833	100.00	219,508	100.00
Arc	305,781	88.63	227,034	90.39	78,747	83.92	194,765	88.73
Incandescent	30,999	8.99	19,977	7.96	11,022	11.75	22,449	10.23
Motor	8,214	2.38	4,150	1.65	4,064	4.33	2,294	1.04
Analysis of expenses—total	344,994	100.00	251,161	100.00	93,833	100.00	219,508	100.00
Office and general expenses	58,013	16.81	47,551	18.93	10,462	11.15	43,620	19.87
Motive power	95,730	27.75	88,906	35.40	6,824	7.27	70,123	31.95
Dynamo expense	34,090	9.88	22,584	8.99	11,506	12.26	18,987	8.65
Wages on distribution	46,638	13.52	23,533	9.37	23,105	24.62	25,713	11.71
Trimmers	40,541	11.75	23,884	9.51	16,657	17.75	20,708	9.43
Carbons	27,762	8.05	17,736	7.06	10,026	10.69	14,928	6.80
Globes	2,313	0.67	1,663	0.66	650	0.69	1,579	0.72
Incandescent renewals	3,966	1.15	1,913	0.76	2,053	2.19	2,504	1.14
Incidental expenses on distribution	35,941	10.42	23,391	9.32	12,550	13.38	21,346	9.73
Analysis of income:								
Arc lighting:								
Gross operating income per arc lamp hour (cents)	3.39		3.75		2.71		5.18	
Net operating income per arc lamp hour (cents)	1.36		1.44		1.22		2.73	
Incandescent lighting:								
Gross operating income per arc lamp hour (cents)	4.86		7.00		2.56		1.89	
Net operating income per arc lamp hour (cents)	3.24		4.98		1.37			
Gross operating income per incandescent lamp hour (cents)	0.61		0.87		0.32		0.35	
Net operating income per incandescent lamp hour (cents)	0.39							
Motor:								
Gross operating income per arc lamp hour (cents)	3.65		3.95		3.49		1.63	
Net operating income per arc lamp hour (cents)	2.38		2.13		2.51			
Analysis of output—total in arc lamp hours	17,670,135		11,057,185		6,612,950		9,070,920	
Arc lamp service in arc lamp hours	15,112,195		9,836,635		5,275,560		7,949,040	
Incandescent lamp service computed in equivalents to arc lamp hours.	1,912,940		992,550		920,390		1,006,123	
Motor service computed in equivalents to arc lamp hours	645,000		228,000		417,000		115,757	

a Eight 16-candle power incandescent lamps rated as the equivalent of 1 arc lamp; 1 horse power in motor service rated as the equivalent of 2 arc lamps.

b Five and four-tenths 16-candle power incandescent lamps rated as equivalent of 1 arc lamp; 1 horse power in motor service rated as the equivalent of 3 arc lamps.

STREET LIGHTING BY ELECTRIC ARC LAMPS.

The following tables, 28, 29, and 30, relate to street lighting by arc lamps in each of the cities and towns in the state of New York where such lamps were used in whole or in part for street lighting during the year ended June 30, 1890, excepting the plant in the city of Dunkirk, owned and operated by the municipal government, which is not included in this report.

The various places are grouped according to the motive power used. Table 28 contains a list of places using steam for motive power, and shows for each place the number of single and the number of double lamps, the currents used, the voltage and ampereage, the cost of coal per ton, the contract rates, and the computed lamp rates. Tables 29 and 30 exhibit the same data as above for those plants using water power and for those using both steam and water power.

For purposes of ready comparison Table 31 is arranged to show the number of lamps, hours of service, and contract rates for the 10 largest cities in the state.

Table 32 is a summary for the entire state of the number of lamps, classified by motive power, and shows the number using 400 watts and over and those using less than 400 watts.

Table 33 presents a comparison of the average rates per lamp hour and per kilowatt hour, classified by motive power, and for 400 watts and over and for less than 400 watt lamps.

The rate per lamp hour is calculated by dividing the rate per year by the number of hours per year burned.

The rate per kilowatt hour is calculated by dividing the rate per year by the product of the kilowatt per lamp, multiplied by the hours per year.

TABLE 28.—MOTIVE POWER: STEAM—STREET LIGHTING BY ARC LAMPS.

CITIES OR TOWNS.	LAMPS AND CURRENTS SUPPLIED.						Cost of coal per ton.	CONTRACTS.				COMPUTED LAMP RATES.			
	Single.			Double.				Term in years.	Nights per year.	Hours per year.	Rate per year per lamp.	400 watts and over.		Under 400 watts.	
	Number of lamps.	Volts.	Amperes.	Number of lamps.	Volts.	Amperes.						Per lamp hour. (Cents.)	Per kilowatt hour. (Cents.)	Per lamp hour. (Cents.)	Per kilowatt hour. (Cents.)
Total number of lamps.	1,360			6,957											
Albany (a)				519	50	10.0	$3.40	5	365	3,950	$182.50	4.6	9.2		
Alexandria Bay	8	50	9.7				1.30	1	365	2,008	77.56	3.9	8.0		
Amsterdam				118	50	6.8	(b)	3	365	3,950	100.00			2.5	7.4
Auburn	77	50	9.6				2.58	1	365	2,370	75.00	3.2	6.6		
Do				50	50	9.6	2.58	3	365	3,950	87.00	2.2	4.6		
Babylon	5	50	6.8	10	50	6.8	4.50	1	365	3,102	109.50			3.5	10.4
Batavia				70	50	9.6	2.00	1	365	1,884	62.50	3.3	6.9		
Binghamton	32	45	10.0	91	45	10.0	1.75	1	365	3,950	131.40	3.3	7.4		
Boonville	7	50	9.6	12	50	9.6	(b)	1	250	1,375	53.66	3.9	8.1		
Brockport	39	45	6.8				2.70	5	264	1,452	72.00			5.0	16.2
Brooklyn	309	46	6.8	1,213	46	6.8	3.50	1	365	3,950	182.50			4.6	14.8
Buffalo				210	30	20.0	1.70	1	365	3,924	146.00	3.7	6.2		
Do				754	45	9.6	2.00	1	365	3,924	146.00	3.7	8.6		
Do				404	45	10.0	2.10	1	365	3,924	146.00	3.7	8.3		
Canandaigua	70	45	10.0				(b)	3½	230	1,265	69.00	5.5	12.1		
Canastota	41	45	10.0	1	45	10.0	3.20	1	365	1,714	72.00	4.2	9.3		
Catskill				49	50	6.8	3.25	1	264	1,716	62.50			3.6	10.7
Clayton				13	50	9.6	2.00	3	276	1,518	69.23	4.6	9.5		
Cooperstown	3	45	8.0				4.40	50	312	1,716	50.00	2.9	8.1		
Cortland	59	20	30.0				(b)	10	264	1,452	79.20	5.5	9.1		
Dansville	26	50	7.5				2.50	3	264	1,452	72.00			5.0	13.2
Dobbs Ferry				22	50	9.6	3.50	1	365	3,200	100.00	3.1	6.5		
Elmira	23	52	8.0				2.27	3	365	3,950	105.85	2.7	6.4		
Do				36	45	6.8	2.27	3	365	3,950	105.85			2.7	8.8
Fort Plain	49	45	6.8				2.85	3	276	1,518	53.75			3.5	11.6
Frankfort	15	20	23.0				(b)	1	312	1,733	92.00	5.3	11.5		
Geneva	64	45	9.6				2.50	5	250	1,375	78.20	5.7	13.2		
Glens Falls	72	50	10.0				3.43	3	276	2,704	71.76	2.7	5.3		
Gloversville				69	50	6.8	4.00	2	365	2,372	60.00			2.5	7.4
Gouverneur				31	50	9.6	(c)	3	276	1,518	50.00	3.3	6.9		
Hornellsville				65	45	9.6	1.90	3	365	3,950	100.00	2.5	5.9		
Hudson				82	50	6.8	3.65	1	365	3,950	116.76			3.0	8.7
Ithaca	76	45	9.5				2.10	5	250	1,750	51.00	2.9	6.8		
Lockport				38	50	9.6	1.90	1	365	3,083	80.00	2.6	5.4		
Lowville	8	50	9.6	19	50	9.6	3.75	1	276	1,518	60.00	4.0	8.2		
Middletown				14	45	6.8	2.75	1	365	3,950	125.00			3.2	10.3

a In Albany the maintenance of hoods, poles, and lamps is paid for by the municipal authorities. b Power rented. c Wood used for fuel.

TABLE 28.—MOTIVE POWER: STEAM—STREET LIGHTING BY ARC LAMPS—Continued.

CITIES OR TOWNS.	LAMPS AND CURRENTS SUPPLIED.						CONTRACTS.					COMPUTED LAMP RATES			
	Single.			Double.			Cost of coal per ton.	Term in years.	Nights per year.	Hours per year.	Rate per year per lamp.	400 watts and over.		Under 400 watts.	
	Number of lamps.	Volts.	Amperes.	Number of lamps.	Volts.	Amperes.						Per lamp hour. (Cents.)	Per kilowatt hour. (Cents.)	Per lamp hour. (Cents.)	Per kilowatt hour. (Cents.)
Mount Vernon				30	50	9.6	(a)	1	365	3,950	$100.00	2.5	5.3		
Newark	40	45	10.0				$2.45	5	312	2,028	60.00	3.0	6.6		
New Brighton				100	50	6.5	3.00	1	365	4,000	80.00			2.0	6.2
Newburg				113	46	6.8	2.14	1	365	3,950	114.00			2.9	9.2
New Rochelle				28	50	6.8	5.25	1	365	3,950	127.75			3.2	9.5
New York				384	35	20.0	3.00	1	365	3,950	127.75	3.2	4.6		
Do				488	45	10.0	3.00	1	365	3,950	127.75	3.2	7.2		
Norwich				35	45	9.6	3.10	1	288	3,096	100.00	3.2	7.5		
Nyack	14	50	9.6				2.25	1	240	2,280	83.40	3.7	7.6		
Do				38	50	9.6	2.25	1	365	3,950	125.55	3.2	6.6		
Do				23	50	9.6	2.25	1	240	1,800	81.92	4.6	9.5		
Ogdensburg	6	45	9.0	84	45	9.0	4.00	5	240	1,440	72.00	5.0	12.3		
Olean				22	45	9.5	(b)	1	365	3,950	120.00	3.0	7.1		
Oneida	10	45	10.0	57	45	10.0	3.00	1	300	1,650	75.00	4.5	10.1		
Oneonta				32	50	9.6	3.25	1	365	3,950	127.72	3.2	6.7		
Potsdam	45	50	6.8				(a)	1	264	1,716	60.00			3.5	10.3
Port Chester				50	50	6.8	3.75	1	365	3,950	100.00			2.5	7.4
Port Jervis	8	50	7.0	8	50	7.0	1.60	2	365	3,950	90.00			2.3	6.5
Do	45	50	7.0	38	50	7.0	1.60	2	365	3,950	105.00			2.7	7.6
Poughkeepsie				215	45	10.0	3.58	1	365	4,014	113.00	2.8	6.3		
Richfield Springs				25	45	9.6	3.50	1	365	2,385	90.00	3.8	8.7		
Rochester				43	45	10.0	2.15	5	365	3,950	98.55	2.5	5.5		
Rome				104	50	10.0	3.00	5	324	3,240	106.92	3.3	6.6		
Do				43	30	23.0	3.00	5	324	3,240	106.92	3.3	4.8		
Sandy Hill	38	50	10.0				3.25	1	276	1,788	84.00	4.7	9.4		
Schenectady				113	20	23.0	3.35	3	365	3,950	135.05	3.4	7.4		
Syracuse				309	48	10.0	2.00	5	365	3,950	144.00	3.6	7.6		
Tarrytown	67	45	6.7				4.19	1	365	2,112	75.00			3.6	11.8
Troy				280	45	10.0	3.00	5	365	3,885	144.00	3.7	8.2		
Unadilla	18	45	10.0				(a)	1	365	2,008	70.00	3.5	7.7		
Utica				368	25	20.0	2.56	3	365	3,650	127.75	3.5	7.0		
Waterloo	51	50	10.0				2.10	5	264	1,452	60.00	4.1	8.3		
White Plains	8	50	6.8				5.25	5	365	2,000	70.00			3.5	10.3
Do				12	50	6.8	5.25	5	365	4,000	140.00			3.5	10.3
Yonkers	27	45	7.0	25	45	7.0	3.08	5	365	3,950	100.00			2.5	8.0
Average rates												3.6	7.7	3.2	9.8

a Power rented.

b Natural gas used for fuel.

TABLE 29.—MOTIVE POWER: WATER—STREET LIGHTING BY ARC LAMPS.

CITIES OR TOWNS.	LAMPS AND CURRENTS SUPPLIED.						CONTRACTS.				COMPUTED LAMP RATES.			
	Single.			Double.							400 watts and over.		Under 400 watts.	
	Number of lamps.	Volts.	Ampères.	Number of lamps.	Volts.	Ampères.	Term in years.	Nights per year.	Hours per year.	Rate per year per lamp.	Per lamp hour. (Cents.)	Per kilowatt hour. (Cents.)	Per lamp hour. (Cents.)	Per kilowatt hour. (Cents.)
Total number of lamps.	284			1,592										
Adams	15	50	9.5				1	264	1,320	$60.00	4.5	9.6		
Carthage				30	48	9.6	5	324	1,782	60.00	3.4	7.3		
Cohoes				100	45	6.8	5	365	3,950	120.00			3.0	9.9
Fulton	74	48	10.0				3	365	2,007	54.00	2.7	5.6		
Greenwich	41	45	10.0				1	240	1,320	50.00			3.8	8.4
Hoosick Falls	33	45	6.8	30	45	6.8	5	276	1,518	60.00			4.0	12.9
Johnstown	50	45	10.0				2	365	2,555	75.00	2.9	6.5		
Jordan (a)	16	50	6.8				1	312	2,744	50.00			1.8	5.4
Mexico	21	50	9.6				5	276	1,518	50.00	3.3	6.9		
New Berlin	1	45	8.0				1	365	3,950	75.00	1.9	5.3		
Niagara Falls				37	45	9.6	1	329	3,300	90.00	2.7	6.3		
Oswego				171	45	9.5	5	365	3,950	100.00	2.5	5.9		
Penn Yan				45	50	9.0	3	365	3,950	73.33	1.9	4.1		
Rochester				274	30	20.0	5	365	3,950	104.02	2.6	4.4		
Do				805	45	9.6	5	365	3,950	102.20	2.6	6.0		
Suspension Bridge				10	45	9.6	1	329	3,300	90.00	2.7	6.3		
Ticonderoga	10	50	6.8				1	365	2,008	75.00			3.7	11.0
Watertown	23	50	10.0	90	50	10.0	7	240	1,320	68.00	5.2	10.3		
Average rates											3.0	6.5	3.1	9.2

a Burn out a full carbon.

TABLE 30.—MOTIVE POWER: STEAM AND WATER—STREET LIGHTING BY ARC LAMPS.

CITIES OR TOWNS.	LAMPS AND CURRENTS SUPPLIED.						CONTRACTS.					COMPUTED LAMP RATES.			
	Single.			Double.								400 watts and over.		Under 400 watts.	
	Number of lamps.	Volts.	Amperes.	Number of lamps.	Volts.	Amperes.	Cost of coal per ton.	Term in years.	Nights per year.	Hours per year.	Rate per year per lamp.	Per lamp hour. (Cents.)	Per kilowatt hour. (Cents.)	Per lamp hour. (Cents.)	Per kilowatt hour. (Cents.)
Total number of lamps.	200			25											
Canton	6	45	6.8	20	45	6.8	(a)	5	276	1,518	$60.00			4.0	12.9
Lyons	54	50	6.8				$2.50	5	312	2,028	60.00			3.0	8.7
Malone	37	47	6.8	5	47	6.8	5.00	1	276	1,518	66.60			4.4	13.7
Mount Morris	32	50	6.0				2.40	5	365	2,007	49.00			2.4	8.1
Phœnix	24	50	6.8				3.00	1	365	2,007	45.50			2.3	6.7
Plattsburg	47	45	6.8				4.00	5	365	2,920	75.00			2.6	8.4
Average rates														3.1	9.8

a Wood used for fuel.

TABLE 31.—LAMPS—NUMBER OF HOURS OPERATED AND RATES IN 10 PRINCIPAL CITIES.

CITIES.	NUMBER OF LAMPS.		Number of hours operated per year.	RATES.				
				Per lamp per year.	400 watts and over.		Under 400 watts.	
	Single.	Double.			Per lamp hour. (Cents.)	Per kilowatt hour. (Cents).	Per lamp hour. (Cents).	Per kilowatt hour. (Cents).
Total number of lamps	368	6,167						
New York		872	3,950	$127.75	3.2	5.9		
Brooklyn	309	1,213	3,950	182.50			4.6	14.7
Buffalo		1,368	3,924	146.00	3.7	7.7		
Rochester		1,122	3,950	102.00	2.6	5.3		
Albany		519	3,950	182.50	4.6	9.2		
Syracuse		309	3,950	144.00	3.6	7.6		
Troy		280	3,885	144.00	3.7	8.2		
Utica		368	3,650	127.75	3.5	7.0		
Binghamton	32	91	3,950	131.40	3.3	7.4		
Yonkers	27	25	3,950	100.00			2.5	8.0
Average rates					3.5	7.3	3.5	11.3

TABLE 32.—CLASSIFICATION OF ELECTRIC ARC LAMPS ACCORDING TO MOTIVE POWER.

LAMPS.	MOTIVE POWER.			
	Total.	Steam.	Water.	Steam and water.
Total number of lamps	a10,418	8,317	1,876	225
Lamps 400 watts and over	1,844	1,360	284	200
Lamps under 400 watts	8,574	6,957	1,592	25

a The difference between this total and that appearing in Table 17 is made up of lamps installed after May 31, 1890, the fiscal year of several stations not closing until after that date.

TABLE 33.—COMPARISON OF AVERAGE RATES OF COST CLASSIFIED BY MOTIVE POWER.

ITEMS.	AVERAGE RATES. (CENTS.)		
	Steam.	Water.	Steam and water.
Per lamp hour, 400 watts and over	3.6	3.0	
Per lamp hour, under 400 watts	3.2	3.1	3.1
Per kilowatt hour, 400 watts and over	7.7	6.5	
Per kilowatt hour, under 400 watts	9.8	9.2	9.8

STREET LIGHTING BY ELECTRIC INCANDESCENT LAMPS.

Table 34 contains a list of cities or towns using incandescent lamps in whole or in part for street lighting. It is arranged to show the number of lamps of each candle power in use, the motive power and cost of fuel, the term of contract in years, rate per year, nights per year, hours per year, and estimated total contract receipts, unit rates per 1,000 candle hours, and per 25 candle power lamp per month. The average unit rates are also stated.

The term in years is the total length of time for which a contract is given.

The receipts are calculated for the given number of lamps at the stated contract rate.

The unit rate per 1,000 candle hours is obtained by reducing the given lamps to the total candle power. The result is multiplied by the number of hours per year, the product divided by 1,000, and the quotient used as a divisor into the total receipts.

The unit rate per 25 candle power lamp per month is obtained by reducing the given lamps to 25 candle power unit and dividing the number of such units into the total receipts, the quotient being divided by the number of months used per year.

TABLE 34.—STREET LIGHTING BY INCANDESCENT LAMPS.

CITIES OR TOWNS.	NUMBER OF LAMPS OF EACH CANDLE POWER. Total lamps.	Candle power grouped by number of candles and number of lamps in each group. 16	20	25	30	32	40	45	65	Motive power.	Cost of coal per ton, delivered at works.	CONTRACT. Term in years.	Rate per lamp per year.	Number of nights per year.	Number of hours per year.	Total receipts per year.	RATE PER UNIT. Per 1,000 candle hours.	Per lamp per month, 25 candle power unit.
Total number of lamps.	a 3,736	313	1,209	2,002	10	151	4	35	12							$62,122		
Baldwinsville	95	95								Water		2	$15.00	365	3,950	1,425	$0.237	$1.95
Ballston (b)	180			180						Steam	$3.52	5	{$16.50 / $22.00}	312 / 365	1,980 / 3,950	3,190	0.293	1.47
Binghamton (c)	50			50						Steam	1.75	1	5.00	120	600	250	0.333	1.25
Boonville	4						4			Steam	(d)	1	(e)	250	1,375	80	0.364	1.50
Brockport	12								12	Steam	2.70	5	24.00	264	1,450	288	0.255	1.05
Camden	48			48						Steam	3.30	5	12.50	365	2,008	600	0.249	1.04
Chatham	80			80						Steam	4.00	5	16.14	276	2,070	1,291	0.312	1.75
Cooperstown	61		61							Steam	4.40	50	14.16	312	1,716	864	0.413	1.70
Dansville (f)	25	13				12				Steam	2.50	3	{$10.00 / $15.00}	365	3,950	310	0.133	1.09
Dolgeville	169	169								Water	(d)	1	12.00	365	3,950	2,028	0.190	1.56
East Albany	176			176						Steam	2.75	2	18.20	365	3,950	3,203	0.184	1.52
Fairport	36	36								Steam	(d)	1	14.50	324	3,396	522	0.267	2.10
Fort Edwards	120			120						Steam	3.33	1	20.00	365	3,950	2,400	0.203	1.67
Hempstead	79		79							Steam	5.62	5	25.00	365	3,950	1,975	0.316	2.60
Holly	62			62						Steam	2.65	3	12.00	264	1,452	744	0.331	1.36
Lockport (g)	203		203							Steam	1.90	1	14.00	365	3,083	2,842	0.227	1.46
Matteawan	235		200					35		Composite	3.07	1	20.00	336	3,590	4,700	0.235	1.88
Mount Morris	6					6				Composite	2.40	5	10.00	365	1,916	60	0.163	0.05
New Berlin	43			43						Water		1	15.00	365	3,950	645	0.152	1.25
New Rochelle	114					114				Steam	5.25	1	25.55	365	3,950	2,913	0.202	1.66
Rochester	676		666		10					Steam	2.15	5	18.25	365	3,950	12,337	0.229	1.89
Sing Sing	43			43						Steam	3.90	1	25.00	365	3,950	1,075	0.253	2.08
St. George	1,200			1,200						Steam	3.00	1	15.00	365	4,000	18,000	0.150	1.25
Waverly	19					19				Steam	2.00	5	20.00	264	1,450	380	0.431	1.78
Average unit rates																	0.254	1.46

a The difference between this total and that appearing in Table 17 is made up of lamps installed after May 31, 1890, the fiscal year of several stations not closing until after that date.

b 140 lamps, run 312 nights per year, at $16.50 per lamp; 40, run 365 nights, at $22.00 per lamp.

c These lamps are in a park and run but 4 months in the year.

d Power rented.

e Special.

f The rate for 16 candle power lamps is $10 per year; 32 candle power, $15 per year.

g Part of these lamps are run to 1 a. m. and others to 3 a. m.

ACCUMULATORS OR STORAGE BATTERIES USED WITH LIGHTING PLANTS.

Two central electric light and power stations have auxiliary plants of storage batteries, viz:

Cooperstown has 56 cells used in series on a continuous current incandescent circuit in the early morning and during the day, when the load is light. The maximum load is stated as 35 amperes, and a 110 volt current is used for charging.

Waterloo uses 126 cells in series on a 3 wire continuous current incandescent system; the maximum load is 30 amperes, and the total capacity of the battery is 300 ampere hours. The voltage of charging current is 132.

Under the head of isolated electric lighting plants, in Table 5, ante, it is stated that the number of accumulator cells in use in the city of New York is 531; in the state of New York, outside of the city, 422; and for the state of New York as a whole, 953. The number of incandescent lamps connected directly to accumulators is shown to be, for the city of New York, 911; for the state of New York, outside of the city, 445; and for the state of New York as a whole, 1,356.

ELECTRIC STREET RAILWAYS.

The first electric street railway in the state of New York commenced operation during the year ended June 30, 1886, since which date to June 30, 1890, there were 10 roads electrically equipped, making 11 in all, installed as follows: 1 road in 1886, 2 roads in 1887, 1 road in 1888, 4 roads in 1889, 3 roads in 1890. Of the total number, 9 originally used horses for motive power and 2 are original electric roads.

The advantages of the adoption of electric motive power may be inferred from the fact that 9 companies, in reply to a special inquiry, report an increase of 69 per cent in the number of passengers carried in the year immediately following the adoption of such motive power in lieu of horses.

The data herein presented deal only with the power plant equipment, electrical equipment, and such details of track construction as are of interest in connnection with questions of electrical traction.

The following table shows the number of power stations, the number and total indicated horse-power capacity of steam engines, the number of electrical generators of each specified capacity, the total number of generators, and the total kilowatt capacity of all generators:

TABLE 35.—STATION EQUIPMENT, ELECTRIC STREET RAILWAYS.

NUMBER OF POWER STATIONS.	STEAM ENGINES.		ELECTRICAL GENERATORS.							
			Number at 500 volts.					Number at 180 volts.	Total number.	Total capacity, kilowatts.
	Number.	Indicated horse power.	125 amperes.	140 amperes.	160 amperes.	200 amperes.	500 amperes.	207 amperes.		
9(a)	22	4,170	15	14	7	4	2	1	43	3,415

a 1 company has 2 stations; 3 companies rent power from electric lighting stations.

The following table relates to motor equipment. The motors in use are continuous current, constant voltage, variable ampereage, series wound, wired in multiple. This table shows the number of motors of each specified capacity, the total number of motors, and the total kilowatt capacity of all motors:

TABLE 36.—MOTOR EQUIPMENT, ELECTRIC STREET RAILWAYS.

MOTORS—CONTINUOUS CURRENT, CONSTANT VOLTAGE, VARIABLE AMPEREAGE, SERIES WOUND, CONNECTED IN MULTIPLE.

TOTAL NUMBER OF MOTORS.	500 VOLTS.					180 VOLTS.		Total kilowatt capacity of all motors.
	20 amperes.	25 amperes.	35 amperes.	40 amperes.	50 amperes.	70 amperes.	94 amperes.	
458	26	381	4	40	4	2	1	5,800

The following table relates to car equipment. This table shows the number of cars carrying one motor, the number of cars carrying two motors, the number of cars carrying the specified horse power in motors, the total number of motor cars, the total horse power of all motors, the number of trail cars, and the average number of cars operated at one time:

TABLE 37.—CAR EQUIPMENT, ELECTRIC STREET RAILWAYS.

TOTAL NUMBER OF MOTOR CARS.	Number of cars carrying one motor.	Number of cars carrying two motors.	HORSE POWER OF MOTORS PER CAR, AND NUMBER OF CARS OF EACH CLASS.						Number of trail cars.	Average number of cars operated simultaneously.
			12 horse power.	15 horse power.	20 horse power.	30 horse power.	50 horse power.	Total horse power of all motors.		
			Number of cars.	Number of cars.	Number of cars.	Number of cars.	Number of cars.			
246	44	202	4	37	26	159	20	6,893	71	182

The following table relates to miscellaneous equipment and car lighting. This table shows the number of electric snow plows and number of plows having the specified horse power in motors per plow, the number of cars lighted by electricity, total number of lamps wired in series in groups of the specified number, total number of lamps used for car lighting, and the number of lamps of the voltages specified. The total number of electrical devices in station is also stated.

TABLE 38.—MISCELLANEOUS EQUIPMENT AND CAR LIGHTING, ELECTRIC STREET RAILWAYS.

NUMBER OF ELECTRIC SNOW PLOWS.	HORSE POWER OF MOTORS PER SNOW PLOW.			CAR LIGHTING.								
					Number and arrangement of lamps.				Voltage of lamps used.			
	15 horse power plows, number.	20 horse power plows, number.	30 horse power plows, number.	Number of cars lighted by electricity	3 in series—lamps, number.	5 in series—lamps, number.	10 in series—lamps, number.	Total lamps used for car lighting.	50 volts—lamps, number.	100 volts—lamps, number.	110 volts—lamps, number.	Number of electrical devices in stations.
7	2	1	4	246	9	1,160	110	1,279	119	900	260	316

The following table relates to details of line construction. This table shows the number of companies using single or double overhead trolley, the number of companies using each specified style of trolley wire suspension, and the miles of road equipped for each, the number of companies using the specified number of poles per mile, the size of trolley wires in use, the number of companies using each size and the number of miles of each size, the size of feeder wires in use, the number of companies using each size and the number of each size, the number of feeder wires leaving power stations and the number of companies using each number specified, the voltage carried at stations and the voltage carried at furthermost terminal, and the number of companies using the respective quantities:

TABLE 39.—LINE CONSTRUCTION, ELECTRIC STREET RAILWAYS—OVERHEAD TROLLEY.

DESCRIPTION.	Number of companies.	DESCRIPTION.	Number of companies.	Number of miles of wire.
Style of service:		**Style of suspension trolley wire**		89.23
Single	10			
Double	1	Cross	5	63.83
Number of poles per mile, counting one side only:		Center pole	1	6.00
35	1	Bracket	4	19.40
42	2	Cross and bracket		
43	1	Center pole and bracket	1	
44	4			
46	1	**Trolley wire, Brown & Sharpe gauge number**		134.70
52	1			
55	1	00	5	55.50
Number of feeder wires leaving power station:		0	3	30.00
1	1	1	1	18.00
2	5	2	1	21.40
4	2	3	1	9.80
6	2			
9	1	**Feeder wire, Brown & Sharpe gauge number (a)**		64.00
Voltage carried at station:		0000	3	14.00
550	1	000	2	10.50
500	8	00	5	34.50
425	1	0	2	5.00
180	1	None	2	
Voltage carried at furthermost terminal:				
475	2			
470	1			
450	3			
425	2			
400	1			
375	1			
160	1			

a One company uses 3 sizes of wire for feeders, and one uses 2 sizes.

The following table exhibits details of track engineering and construction. The total mileage of streets over which electric cars are operated is 89.23. The gauge of track is uniformly 4 feet 8½ inches, or "standard gauge".

TABLE 40.—ENGINEERING AND CONSTRUCTION, ELECTRIC STREET RAILWAYS.

	FEET RADIUS.
Radius of minimum curve of track:	
1 company reports	30
1 company reports	35
1 company reports	36
1 company reports	40
1 company reports	45
1 company reports	50
1 company reports	60
1 company reports	75
1 company reports	100
1 company reports	175
1 company reports	269
Maximum grade, rise per 100 feet of track:	FEET.
2 companies report	2
1 company reports	3
1 company reports	4
2 companies report	5
1 company reports	6
3 companies report	8
1 company reports	15

MILEAGE OF SPECIFIED WEIGHTS OF RAIL.

DESCRIPTION.	POUNDS PER YARD AND MILEAGE OF EACH WEIGHT.											
	Total.	25	35	40	45	47	50	55	60	62	63½	66½
Mileage of each weight	133.70	0.75	21.30	13.40	20.50	0.75	7.00	12.50	12.50	9.50	18.00	17.50
Girder rails	52.00	.....	.....	.....	.....	.....	7.00	.....	.....	9.50	18.00	17.50
T rails	53.15	0.75	6.00	13.40	8.00	.....	.....	12.50	12.50	.....	.....	.....
Tram rails	28.55	.....	15.30	.....	12.50	0.75	.....	.....	.....	.....	.....	.....

ELECTRIC WELDING.

One company commenced the use of electric welding October 1, 1890. It installed one electric welder of 20,000 watts capacity. This welder is used for welding fifth wheels for heavy wagons. The method superseded by electric welding was forge welding. The owners of the establishment certify that an electric weld for this work can be made in 10 minutes, whereas the time required for making a similar weld by forge welding was 45 minutes; that the saving in expense is about 38 cents per weld, after paying 10 cents per weld royalty, over the expense of forge welding. The cost and present value (1890) of the welder is stated to be $2,000.

ELECTRIC SMELTING.

The first electric smelting company commenced business in 1887. The cost of the works, including $21,000 for land and power site, was $90,000; the cost of additions since made was $50,000, making the total cost of the works $140,000; from this cost $15,000 is deducted, making the present value of the works as given (1890) $125,000.

The power plant consists of 1 steam engine, 1,000 horse power capacity, and 4 horizontal water wheels of 500, 480, 50, and 200 horse power respectively, using head water averaging 34 feet.

The electric plant for smelting consists of four dynamos, continuous current, constant voltage, variable ampereage, of the following capacities: three dynamos of 70 volts, 3,000 amperes, 210,000 watts each, and one dynamo of 50 volts, 1,200 amperes, 60,000 watts; also one dynamo of 500 volts, 6.8 amperes, 3,400 watts, used for lighting purposes.

The total capacity of the dynamos used for smelting purposes is 690,000 watts.

The raw material used is aluminum, silica, manganese, copper, and iron ores, partly imported from Germany and partly from southern states of the United States. The quantity of raw material handled is about 2,000 pounds per day. Electricity is used for heat only. The anode and the cathode are composed of carbon and metal and other materials. The crucibles are connected in series, varying in number from 6 to 8. The whole number of crucibles used varies from 2 to 20. The products are aluminum and alloys, and the alloys of silicon and of manganese. The quantity of refined metal produced per day is 1,500 pounds.

USES OF ELECTRICITY IN MEDICINE AND SURGERY.

The uses of electricity in medicine and surgery are being rapidly developed as an important part of medical science. Without attempting to give exact technical details, which can properly be based only on professional reports, carefully verified and compiled by an expert specialist in this department of science, the following data are given for the state of New York, as indicative of the condition of the art and its practice in 1890:

6 manufacturers report manufactures of electrical specialties for the uses of medicine and surgery.

5 medical colleges report giving a course of instructions in electro-therapeutics and electro-surgery.

51 hospitals report making 17,071 applications of electricity in medical and surgical practice.

65 physicians report having electrically treated 16,072 patients during the census year of 1890.

DISTRICT MESSENGER ELECTRICAL CALL SERVICE.

The first American district telegraph company was organized in 1872. It commenced business with 1 office and 4 subscribers. In 1874 there were 10 offices and 200 subscribers in the state of New York. In 1878 there were 21 offices, 4,500 subscribers, and 600 messengers. In 1885 there were 52 offices, 11,897 call boxes (subscribers), and 903 messengers.

The first messenger call boxes used by the company had spring clockwork which required winding up with a key. They were covered by a glass globe. In 1874 automatic call boxes were substituted for the winding clockwork instruments.

The following table shows details relating to the number of companies reported for the state of New York, number of shareholders, total capitalization, capital employed, wages, and all other expenses (excepting depreciation of plant), and total income:

TABLE 41.—GENERAL STATEMENT.

Number of companies reported	9
Number of shareholders	369
Total capitalization	$3,187,682
Share investment	3,150,804
Surplus	36,878
Capital employed—aggregate	1,540,785
Plant, total	1,081,460
Live assets—total	459,325
Value of franchise	243,600
Value of securities	215,725
Wages	434,597
Average number of employés	1,599
Managers and office force	167
Messenger force	1,379
Construction and repair force	33
Police detail	20
Miscellaneous expenses	$150,288
Rent of central offices	9,643
Rent of other offices	25,739
Privileges of poles	936
Telephones	180
Office furniture and repairs	2,973
Stationery	9,055
Fuel and light	4,618
Instruments, renewals, and repairs	1,487
Batteries, renewals, and repairs	2,440
Lines, renewals, and repairs	28,667
Insurance	39
Sundries, not elsewhere reported	64,511
Total income	659,861

The following table shows details regarding operating instruments, batteries, miles of wire, line construction, and service capacity; also, services performed:

TABLE 42.—FACILITIES FURNISHED AND SERVICES PERFORMED.

Operating instruments:	
Galvanometers	1
Automatic signal receiving	25½
Telephones	10
Batteries:	
Leclanché, number	568
Bluestone, number	2,945
Miles of wire—total	1,114
Insulated copper	421
Galvanized iron	213
Insulated iron	459
Conductor in cable (carried in 2 miles of cable)	21
Line construction:	
Miles of circuits	1,114
Total number of circuits	428
Grounded	16
Metallic	412
Service capacity:	
Number of circuits	428
Number of offices	76
Number of call boxes	25,009
Services performed:	
Number of calls	2,624,748
Number of messages collected	1,766,745
Number of messages delivered	5,449,235
Average number of calls per box	104.95
Average number of calls per messenger	1,903.37

MUNICIPAL POLICE PATROL TELEGRAPH SERVICE.

There are 5 cities in the state of New York reporting the use of police telegraph service.

The following table shows the value of the plants, wages, average number of employés, and the amount of miscellaneous expenses for the year, excluding allowance for depreciation of plant:

TABLE 43.—INVESTMENT AND EXPENSES.

Number of municipalities reporting	5
Value of plant—total	$127,273
Office fixtures and furniture	831
Electric plant in station	34,850
Underground conductors	9,323
Aerial service conductors	32,469
Terminal apparatus and stations	49,550
Supplies on hand	250
Wages	45,560
Average number of employés	32
Superintendents and inspectors	14
Clerks and operators	17
Helpers and watchmen	1
Miscellaneous expenses	$15,850
Telephone rentals	7,927
Repairs to office fixtures	175
Stationery	25
Repairs and renewals to instruments	1,350
Repairs and renewals to batteries	1,498
Repairs to lines	650
Sundries not elsewhere reported	4,225

The following table is arranged to show the number of operating instruments in use, the number of batteries and generators, the mileage and kinds of wire, number and type of circuits, location and style of patrol boxes, and location of telephone stations:

TABLE 44.—FACILITIES FURNISHED.

Operating instruments—total number	1,178
Transmitting	544
Receiving	222
Telephones	412
Signal announcing and registers—total number	64
Visual indicators with gongs	19
Gongs	35
Ink registers	10
Testing instruments—total number	44
Galvanometers	43
Testing sets	1
Batteries—total number	2,318
Leclanché	351
Bluestone	1,277
Smee	395
Dry	275
Carbon	20
Generators, power	1
Miles of wire—total	600
Galvanized iron, bare	90
Galvanized iron, insulated	300
Bare copper	107
Insulated copper	70
Miles of conductor in cables	33
Number and style of circuits	62
Patrol box circuits	32
Other circuits	30
Miles of circuits	600
Patrol box circuits, metal	196
Patrol box circuits, grounded	35
Other circuits, metal	59
Other circuits, grounded	310
Location of patrol boxes—total number	394
On buildings	29
On poles	175
In booths	185
In patrol wagon stations	5
Patrol boxes, operated by spring	394
Location of telephone stations—total number	81
Patrol wagon stations	11
Police stations	31
Ambulance stations	5
Coroners' offices	6
Police headquarters	23
Municipal offices	2
Residence of members of the force	3

The following table shows the amount and character of the service rendered:

TABLE 45.—USE MADE OF FACILITIES.

Character of service:	
Number of calls—total	1,964,043
Coroner notified	6,136
Relating to fires	69,694
Description of stolen property	23,905
Description of missing persons	47,242
Classified	132,583
Miscellaneous	1,648,558
Character of service—Continued.	
Wagon calls—total number	35,925
Conveyance of prisoners	14,708
Conveyance of injured persons	6,429
Conveyances of officers to fires	445
Miscellaneous calls	14,343

MUNICIPAL FIRE ALARM TELEGRAPH SERVICE.

There are 36 cities in the state of New York reporting the use of fire alarm telegraph service.

The following table shows the value of the plants, wages, average number of employés, and the amount of miscellaneous expenses for the year:

TABLE 46.—INVESTMENT AND EXPENSES.

Number of municipalities reporting	36
Value of plant—total	$813,958
Office furniture	3,465
Electric plant in station	79,694
Aerial conductors	152,805
Underground conductors	243,760
Terminal apparatus and stations	328,026
Supplies on hand	6,208
Wages	108,592
Average number of employés	140
Superintendents, inspectors, and linemen	56
Clerks and operators	31
Helpers, watchmen, and others	53
Miscellaneous expenses—total	$38,811
Rental for telephones	5,244
Repairs to office fixtures	1,781
Stationery	29
Fuel and light	302
Repairs and renewals to instruments	4,737
Repairs and renewals to batteries	9,119
Repairs to lines	8,564
Insurance	124
Sundries not elsewhere reported	8,911

The following table is arranged to show the number of operating instruments in use, the number of batteries, the mileage of and kind of wire, number and type of circuits, location and number of boxes and bells, number and style of alarm boxes, number and style of receiving and recording devices; also, the number of alarms and value of property destroyed during the year :

TABLE 47.—FACILITIES FURNISHED AND USE MADE THEREOF.

Alarm, announcing apparatus:	
Visual indicators combined with gongs	82
Visual indicators	21
Gongs	333
Bellstrikers	44
Jokers	31
Sounders	44
Telephones	221
Testing instruments	239
Galvanometers	235
Testing sets	4
Batteries	7,483
Leclanché	413
Bluestone	1,070
Miles of wire—total	2,866
Galvanized iron	1,823
Galvanized iron, insulated	3
Galvanized steel	7
Bar copper	412
Insulated copper	96
Length of conductor in 106 miles of cable (a)	525
Number of circuits, continuous current	218
Grounded	17
Metallic	201
Location and number of boxes and bells communicating:	
On buildings	524
On poles	2,176
In engine houses	314
In municipal offices	26
In residences of members of the force	43
Public alarm bells	44
Alarm boxes:	
Operated by weight	347
Operated by spring	2,606
Having keyless doors	292
Having trap locks	2,529
All other styles	132
Central office receiving and recording devices:	
Register, inking	28
Register, embossing	5
Repeaters, dial	6
Repeaters, automatic	14
Others	12
Number of alarms during the year—total	61,550
Alarms during the day	2,936
Alarms during the night	3,357
False alarms	153
Test alarms	55,104
Value of property destroyed during the year	$7,825,241

a Nearly all of this cable is underground.

CHEMICALS AND ALLIED PRODUCTS.

CHEMICALS AND ALLIED PRODUCTS.

BY HENRY BOWER AND HENRY PEMBERTON, JR.

The Tenth Census was the starting point for the publication of special reports relating to the manufacture of chemicals, but owing to changes in the form of inquiry and the inclusion of certain allied industries not reported as chemicals at the census of 1880, and the exclusion of others that were included under this head at the Tenth Census, a true comparison is impossible.

Castor oil, glucose, and soap, allied products included in the chemical report of the Tenth Census, were not so enumerated at the Eleventh. Pharmaceutical preparations, ready mixed paints, varnishes, and japans, reported among the general statistics of manufactures in 1880, are included in the totals presented in this report. Baking powder, blacking, cottonseed oil, glue, inks, linseed oil, patent medicines or proprietary goods, vinegar, whiting, and paris white appear in the general statistics of manufactures for both census years.

The totals for the chemical industry, as reported at the Eleventh Census, are shown in the following summary:

SUMMARY OF STATISTICS OF THE CHEMICAL INDUSTRY: 1890.

Number of establishments reporting	1,626
Capital:	
Direct investment	$168,462,044
Value of hired property	$12,098,037
Miscellaneous expenses	$13,640,343
Average number of employés (aggregate)	43,701
Total wages	$25,321,077
Officers, firm members, and clerks:	
Average number	5,953
Total wages	$7,464,260
All other employés:	
Average number	37,748
Total wages	$17,856,817
Cost of materials used	$106,521,980
Value of products	$177,811,833

PRINCIPAL PRODUCTS REPORTED, THEIR QUANTITY AND VALUE: 1890.

PRODUCTS.		Quantity.	Value.
Total			$177,811,833
Alum	lbs.	93,998,008	1,616,710
Coal tar products			687,591
Dyeing and tanning extracts and sumac	lbs.	187,906,911	8,857,084
Gunpowder and other explosives	lbs.	125,645,912	10,993,131
Fertilizers	tons.	1,898,806	35,519,841
Paints, colors, and varnishes			52,908,252
Pharmaceutical preparations			16,744,643
Potash and pearlash	lbs.	5,106,939	197,507
Sodas	lbs.	333,124,375	5,432,400
Sulphuric acid (a)	lbs.	1,384,776,972	5,198,978
Wood alcohol and acetate of lime			1,885,469
Chemicals (including all acids, bases, and salts not heretofore enumerated)			24,751,974
All other products			13,018,253

a Includes 581,536,200 pounds manufactured and consumed in the manufacture of fertilizers for which no value is given as sulphuric acid.

Table 1 is a comparative statement giving the results of the inquiry in detail of items common to the censuses of 1880 and 1890 by state totals.

A chemical plant may appear to be only a mass of rude furnaces, pots, and rough machinery, yet the establishment may contain appliances of the most costly description, such as underground flues; furnaces of the most modern construction; iron castings, fashioned in innumerable forms and weights; copper vessels, coils, and stills; thousands of fire bricks and other forms of refractory material; steam boilers of the most economical pattern; lofty chimneys; powerful engines; expensive pumps; mills of different forms for the grinding and powdering of a great variety of materials; leaden chambers for acid making, with tanks, towers, and accessories of the same metal, and chemical earthenware, vitrified to resist the action of acids.

A high degree of skill and scientific knowledge combined with the use of elaborate and expensive plants have now become essential to the successful manufacture of chemicals to an extent unthought of by those engaged in the industry 20 or even 10 years ago. The laboratory, well equipped with careful workers and good apparatus, has become the pulse of the whole establishment. Each step in the various processes is governed by the results obtained by the analyst and tester, while the huge and costly machinery of the factory is the counterpart, to a great extent, of the miniature equipment of the laboratory.

The materials used in chemical manufacture are of great variety and number, ranging from the crudest substances (atmospheric air being one of the most important) to those bearing the highest stamp of refinement. The precious metals, for example, yield salts that are invaluable in the materia medica and in photography and other arts. The products of many works are used solely as the materials for other processes that are carried on in separate and perhaps remote factories. The processes used in making chemicals are almost as varied as are the articles produced, but certain leading steps are essential to all, as grinding, furnacing, dissolving, separating, evaporating, filtration, and crystallization. The laws governing chemical constituents are closely followed at each step and the processes improved and revised from time to time by the aid of modern mechanical contrivances. These changes are rendered more and more necessary in the sharp competition of the age.

Many chemical operations demand a long time for the production of finished products. Crystallization is of slow growth in many instances, and decomposition takes place very gradually in others. Both crystallization and decomposition are hastened or retarded by many physical conditions. Heat and cold, intense motion, or absolute quietude are in their turn called to the aid of the chemist.

The method of inquiry at the Eleventh Census respecting capital was intended to develop the full amount of all classes of capital represented by money and by property of every kind, owned, borrowed, and hired, employed in the industry.

No previous census inquiry has embraced the cost incurred in manufacturing operations other than that of wages and materials. The current inquiry is intended to embrace all expenses of production with the exception of depreciation of plant. The difference between cost and the value of products, however, must not be taken as a correct indication of manufacturers' profits, because these statistics contain no information as to cost of selling, mercantile losses, and depreciation of plant.

Table 2 presents by totals for the different states and territories and for the United States detailed information concerning capital, miscellaneous expenses, employés and wages, materials used, and value of products, as reported at the Eleventh Census.

These tables show the quantity and value of the different articles manufactured. Of these special attention is called to the following: sulphuric acid; fertilizers; soda; paints, colors, and varnishes; alum; potash and pearlash; acetate of lime and wood alcohol, and chemicals used in pharmaceutical preparations.

SULPHURIC ACID.

Sulphuric acid is among the most important of chemical products. At the census of 1880, 49 establishments were reported as engaged in the manufacture of this acid, producing 308,765,432 pounds, valued at $3,661,876; in 1890 there were 105 establishments, manufacturing 1,384,776,972 pounds. Of this quantity, 581,536,200 pounds, estimated as being worth $2,480,495, were produced and consumed as an intermediate product by establishments engaged in the manufacture of fertilizers, making the total value of all sulphuric acid manufactured in the United States during the census year $7,679,473, an increase in value of 109.71 per cent over 1880 and in quantity of 348.49 per cent. The large increase in the number of establishments and the quantity produced, together with the reduction in price, indicates the advance that has been made in this branch of the industry in the United States during the last decade.

Under this heading there is given in the accompanying tables the production of 50° baumé sulphuric acid, 60° baumé sulphuric acid, and 66° baumé sulphuric acid (oil of vitriol).

A portion of the 50° baumé acid made in certain states is used as an intermediate product by establishments engaged in the manufacture of fertilizers. The value of such acid is not shown, as it is included in the value of fertilizers, and to attach a separate value to it would cause a duplication. Therefore, under the head of 50° baumé there is given in the column of pounds the total quantity manufactured.

The following statement gives the quantity of 50° baumé acid manufactured in the several states and used as an intermediate product in the manufacture of fertilizers:

SULPHURIC ACID PRODUCED AND CONSUMED BY ESTABLISHMENTS MANUFACTURING FERTILIZERS: 1890.

	POUNDS.
Total	581,536,200
Georgia	96,138,400
Maryland	155,900,800
Massachusetts	55,900,000
Michigan	7,275,600
New Jersey	5,000,000
North Carolina	6,192,000
Ohio	15,000,000
South Carolina	211,009,400
Virginia	29,120,000

The total quantity of 50° baumé acid produced in the United States was 1,009,863,407 pounds. Deducting from this the total shown in the above statement, 581,536,200 pounds, there remains a total of 428,327,207 pounds, the value of which is $1,826,572. This is equal to $8.53 per ton of 2,000 pounds. Applying this average value per ton to the total quantity of 50° baumé acid manufactured (1,009,863,407 pounds), a total value of $4,307,067 is obtained.

The quantity of 60° baumé acid manufactured in the United States during the census year was 20,379,908 pounds, valued at $122,940, equivalent to $12.06 per ton of 2,000 pounds.

The amount of 66° baumé acid made was 354,533,657 pounds, valued at $3,249,466, equivalent to $18.33 per ton of 2,000 pounds.

In order to obtain an intelligent idea of the extent of the sulphuric acid industry it is advisable to reduce the figures of the tables to a uniform basis, that of 66° baumé acid (oil of vitriol). As this contains from 93 to 94 per cent of real monohydrate acid ($H_2S\ O_4$), the reduction is made by multiplying the pounds of 50° baumé acid by $1\frac{2}{3}\frac{8}{3}$ and the pounds of 60° baumé acid by $1\frac{2}{2}\frac{2}{8}$. By so doing we obtain the results given in the following statement, the 50° baumé acid used in making fertilizers being included:

STRENGTH, BAUMÉ.	Pounds of acid as manufactured.	Equivalent to pounds of 66° acid.
	Total	1,044,759,185
50°	1,009,863,407	673,242,271
60°	20,379,908	16,983,257
66°	354,533,657	354,533,657

The total quantity of sulphuric acid produced in the United States reduced to a uniform strength of 66° baumé is accordingly 1,044,759,185 pounds, or 522,380 tons of 2,000 pounds each.

The reduction to a uniform strength of 50° baumé is made by multiplying the pounds of 60° baumé acid by 1.25 and the pounds of 66° baumé acid by 1.50. The following statement shows the result of this reduction:

STRENGTH, BAUMÉ.	Pounds of acid as manufactured.	Equivalent to pounds of 50° acid.
	Total	1,567,138,777
50°	1,009,863,407	1,009,863,407
60°	20,379,908	25,474,885
66°	354,533,657	531,800,485

Supposing all the chambers to be running 365 days in the year, we find the amount of 50° acid and equivalents manufactured in each 24 hours to be 4,293,531 pounds, or 2,147 tons.

FERTILIZERS.

Manufactured manure is next in importance to sulphuric acid in the category of chemical products. During the census year there were 392 establishments reported as engaged in the production of chemical fertilizers, manufacturing 1,898,806 tons valued at $35,519,841, as compared with 278 establishments manufacturing 727,453 tons valued at $19,921,400 at the census of 1880, being an increase in quantity of 161.02 per cent and in value of 78.30 per cent.

SODA.

In the last decade the manufacture of soda salts increased enormously in the United States. During the census year there were 32 establishments reported as manufacturing soda, with a product of 333,124,375 pounds, valued at $5,432,400. At the census of 1880 there were 40,259,938 pounds manufactured, valued at $866,560, the increase in quantity being 727.43 per cent and in value 526.89 per cent.

PAINTS, COLORS, AND VARNISHES.

A quantity of dry white lead and oxide of lead is manufactured and consumed by establishments engaged in the production of "paints in oil, in paste". While the quantity consumed in this manner is shown, its value is not given, as it is included in the value of "paints in oil, in paste".

The following statement shows the quantity of dry white lead and oxide of lead manufactured in the several states and used as an intermediate product in the manufacture of paints in oil, in paste:

DRY WHITE LEAD AND OXIDE OF LEAD REMANUFACTURED BY ESTABLISHMENTS ENGAGED IN THE MANUFACTURE OF PAINTS IN OIL, IN PASTE: 1890.

	POUNDS.
Total	80,915,582
California (dry white lead)	7,000,000
Illinois (dry white lead)	7,170,997
Kentucky (dry white lead)	1,305,460
Missouri (dry white lead)	29,003,259
Nebraska (dry white lead)	6,585,000
Ohio (dry white lead)	19,271,791
Pennsylvania (dry white lead)	10,266,823
Missouri (oxide of lead)	312,252

The entire production of dry white lead and oxide of lead in the United States was 168,282,478 pounds. Deducting from this the total given in the above statement, there remains a total of 87,366,896 pounds manufactured and sold dry to the trade, the value of which is $4,536,204.

During the census year there were 27 establishments reported as engaged in the manufacture of white lead. The quantity manufactured was 143,620,471 pounds as compared with a product of 123,477,890 pounds in 1880, an increase of 16.31 per cent. The average value per pound has declined from 7.1 cents in 1880 to 5.2 cents in 1890.

The number of establishments manufacturing barytes in 1890 was 13, with an output of 43,143,000 pounds, valued at $377,939. The number of pounds reported at the census of 1880 was 38,330,000, valued at $371,829. The increase in quantity of 1890 over 1880 was 12.56 per cent and in value 1.64 per cent.

The number of establishments manufacturing oxide of zinc either as a principal product or as a by-product in 1890 was 7, reporting a product of 17,648,000 pounds, valued at $695,920, as compared with 20,121,761 pounds, valued at $766,337, in 1880, a decrease in quantity of 12.29 per cent and in value of 9.19 per cent.

ALUM.

During the census year there were 10 establishments reported as engaged in the manufacture of alum either as a principal or as an incidental product. The quantity manufactured was 93,998,008 pounds, valued at $1,616,710, as compared with 39,217,725 pounds, valued at $808.165, reported at the census of 1880. The increase in quantity was 139.68 per cent and in value 100.05 per cent.

POTASH AND PEARLASH.

The manufacture of potash and pearlash by the leaching of wood ashes shows but an insignificant increase from 1880 to 1890, which is due, to some extent, to the substitution for it of caustic soda and soda ash. The number of establishments engaged in its manufacture in 1890 was 75 and in 1880, 68. The total quantity manufactured in 1890 was 5,106,939 pounds, valued at $197,507, and in 1880, 4,571,671 pounds, valued at $232.643, an increase in quantity of 11.71 per cent and a decrease in value of 15.10 per cent.

ACETATE OF LIME AND WOOD ALCOHOL.

In 1890 there were 53 establishments engaged in the manufacture of acetate of lime and crude methylic or wood alcohol, manufacturing a product of 26,778,415 pounds of acetate of lime, valued at $315,430, and crude wood alcohol to the value of $613,607. In 1880 there were 17 establishments engaged in this branch of the chemical industry, manufacturing 6,593,009 pounds of acetate of lime, valued at $156,892, and wood alcohol, crude, valued at $86,274. The increase of 1890 over 1880 in acetate of lime was 306.16 per cent in quantity and 101.05 per cent in value, and in crude wood alcohol the increase in value was 611.23 per cent. It should be stated in this

connection that the quantity of crude wood alcohol, 949,733 gallons, shown in the tables, does not represent the entire quantity manufactured. It does not include 166,342 gallons, the product of 4 establishments that did not sell their product in its crude condition, but refined it, it being in such cases reported as wood alcohol. refined. This quantity would increase the production in the United States to 1,116,075 gallons.

COMPRESSED AMMONIA GAS OR ANHYDROUS AMMONIA.

The use of compressed ammonia gas has reached large proportions in the last decade, and has proved a valuable aid in the preservation of food, the refrigeration of malt liquors, and the manufacture of ice. The introduction of the use of anhydrous ammonia has given great impetus to the manufacture of the special machinery adapted to its employment in the departments named. Taken as a whole, its manufacture may be classed as a distinct branch of industry.

CHEMICALS USED IN THE DYEING AND FINISHING OF TEXTILES.

It appears from the report for the Eleventh Census on the dyeing and finishing of textiles, considered as a distinct industry, prepared by Mr. P. T. Wood, that chemicals and dyestuffs to the value of $8,407,693 were consumed by the 248 establishments engaged in this industry, to which must be added $11,357,489, the value of chemicals and dyestuffs consumed during the census year by textile manufacturers who do their own dyeing and finishing, making a total of $19,765,182 as the value of this class of chemicals consumed in the textile industry.

PHARMACEUTICAL PREPARATIONS.

Pharmaceutical preparations, which are produced in consequence of the demand for more palatable material for the materia medica, cover a large field, including pills, lozenges, fluid extracts, and a great variety of elixirs.

The producers of these articles have succeeded in most instances in masking or altogether obliterating the unpleasant properties of drugs, and have developed an industry of great commercial importance.

FUEL.

The chemical industry is a large consumer of fuel, hence great interest attaches to its supply. Its expense is of great importance in computing the costs of these manufactures.

Many fuel saving devices are to be found in chemical works, and within the past 2 or 3 years fuel oil has become of considerable importance. Natural gas, also, has been utilized in chemical works in localities adjacent to a supply, and its use has proved a great convenience.

EMPLOYÉS AND WAGES.

Statistics relating to employés and wages are presented in detail in Tables 3 and 4. Table 3 gives employés by classes, namely: officers and firm members actively engaged in the industry or in supervision; clerks; operatives and skilled workmen and unskilled workmen ; the average number of males, females, and children, respectively, with the average weekly earnings and the total wages in the respective classes; also pieceworkers, with their earnings. Table 4 gives the weekly rates of wages paid, with the average number of employés at each rate (not including pieceworkers), for men, women, and children, respectively, and the number of pieceworkers with their earnings.

The average number of employés is the number necessary to be continually employed during the time the establishment is reported as being in operation in the census year to perform the work of a varying number.

Upon this basis the computations are made to obtain "the average weekly earnings". The number of weeks reported by individual establishments as their term of operation is multiplied by the average number of employés; the product is the number of weeks required for 1 employé to perform the labor. The sum of these products of individual establishments divided into the sum of the wages for the same establishments produces the true average weekly earnings per employé.

In making comparisons of average weekly earnings in the different states the character of their principal product should be considered. The nature of the products embraced by the classification "chemicals and allied products" is varied, requiring in some instances the highest skill and care in their manufacture, and in others the most ordinary class of labor, including but few skilled or high priced workmen.

The following statement presents totals concerning employés and wages, and shows the average number of men, women, and children in each 100 employés; also the percentage that the wages of each group is of the total wages for the industry during the census year:

EMPLOYÉS.	Average number.	Total wages.	Number in each 100 employés.	Percentage of total wages.
Total	43,701	$25,321,077	100	100.00
Males above 16 years	39,372	24,093,919	90	95.15
Females above 15 years	3,983	1,171,974	9	4.63
Children	346	55,184	1	0.22

In the following statement the employés are presented by classes, as shown in Table 3, with the number of each class in each 100 employés; also the percentage that the wages of each class is of the total wages:

EMPLOYÉS.	Average number.	Total wages.	Number in each 100 employés.	Percentage of total wages.
Total	43,701	$25,321,077	100	100.00
Officers or firm members	2,262	3,725,971	5	14.72
Clerks	3,691	3,738,289	9	14.76
Operatives and skilled employés	20,561	10,767,713	47	42.52
Unskilled employés	15,467	6,425,614	35	25.38
Pieceworkers	1,720	663,490	4	2.62

The inquiry at the Eleventh Census divided wage earners proper into three classes: first, operatives, engineers, and other skilled workmen, overseers and foremen, or superintendents (not general superintendents or managers); second, watchmen, laborers, teamsters, and other unskilled workmen; third, pieceworkers.

It appears from the above statements that a very small proportion of women and children are employed in the chemical industry, and that 47 per cent of the employés are skilled and 35 per cent unskilled, the pieceworkers being comparatively few in number.

DISTILLED SPIRITS CONSUMED IN THE ARTS, MANUFACTURES, AND MEDICINE IN THE UNITED STATES.

Inasmuch as the cost of distilled spirits constitutes the largest outlay in the manufacture of pharmaceutical preparations, an investigation into the quantity of alcohol used for this purpose becomes invaluable.

Tables 5, 6, 7, and 8 show the total consumption of each form of distilled spirits in the United States, by totals for states and territories, as compiled from the returns of manufacturers and wholesale druggists, eleemosynary institutions, and retail apothecaries. The total consumption of all forms of distilled spirits amounted to 10,976,842 proof gallons.

Previous statements concerning the quantity of distilled spirits consumed in the arts, manufactures, and medicine were merely estimates, whereas the quantities given in these tables are the results from definite returns.

The estimates were founded principally upon two bases: first, the quantity of alcohol consumed in the arts, manufactures, and medicine in the United States; and, second, the quantity of distilled spirits of all kinds so consumed.

Concerning the amount of alcohol alone so consumed the Secretary of the Treasury, in his annual report of December 2, 1889 (page xxix), estimated the amount at about 6,000,000 proof gallons.

While of all forms of distilled spirits alcohol is that which is most largely used in the arts, it would nevertheless be a serious error to assume that it is the only form of distilled spirits so consumed. Cologne spirit is used for many purposes for which alcohol, on account of containing certain impurities, would be unsuitable. This is particularly true in relation to the preparation of a large number of fine chemicals. Whisky, brandy, rum, and gin are likewise used in the manufacture of proprietary medicines and certain pharmaceutical preparations, such as tinctures and medicinal wines.

The Statistical Abstract of the United States, prepared by the Bureau of Statistics under the direction of the Secretary of the Treasury, gives the quantity of distilled spirits consumed in the country as 80,613,158 gallons in 1889.

There are no estimates of so high authority for the quantity used of other forms of distilled spirits as that of the Secretary of the Treasury for the quantity of alcohol used, but an estimate of 15 per cent of all distilled spirits consumed as used in the arts and manufactures would be equivalent to 12,000,000 gallons in round numbers.

THE METHOD ADOPTED BY THE CENSUS OFFICE IN MAKING THIS INVESTIGATION.

In entering upon this investigation two difficulties were encountered. In the first place, the use of distilled spirits for manufacturing and medicinal purposes is so widespread and extends into so many and such varying industries that the problem of obtaining statistics thereof is a very difficult one. In the second place, the same quantity or lot of distilled spirits is frequently handled by several firms. It therefore became necessary to adopt some means of preventing duplication of returns by these several establishments. It was evident that grave errors would enter into an investigation of this kind unless great care was taken to avoid such duplication. A thousand gallons of alcohol, for instance, handled by a wholesale drug house would appear in its return. A certain part of this, it may be assumed, was sold by the wholesale firm to a retail apothecary. The latter in filling out the census schedule would report this quantity as handled by him. There would in this instance be an error amounting to the quantity handled by the retail apothecary.

To surmount the difficulty each establishment was requested not only to report the quantity of distilled spirits consumed and sold but also to state the source whence bought. For this purpose there was inserted in each schedule prepared for this inquiry a special column, headed "State whether bought from liquor trade or other trade", this statement to apply to each form of distilled spirits enumerated.

In tabulating the returns the quantities reported as purchased from the liquor trade were tabulated separately from those purchased from other sources, and in the final summing up of the investigation the only figures used were those which represented the quantities purchased direct from the liquor trade. The returns from the above mentioned retail apothecary, for example, would thus be excluded from the final result, inasmuch as his return showed that his purchases had been made from the wholesale drug trade. In this manner duplication of quantities was avoided.

The establishments to which schedules were sent were divided into the following classes for the sake of convenience: manufacturers and wholesale druggists, eleemosynary institutions (dispensaries, homes, asylums, and others of like nature), and retail apothecaries.

Separate schedules were used for these classes, special care being taken to adapt each form of schedule to the requirements of the establishments to be returned thereon. Particular instructions were given not to enumerate distilled spirits used as a beverage. The entire number of schedules sent out was about 400,000.

The result of the inquiry has shown that the total quantity of distilled spirits consumed in the arts, manufactures, and medicine in the United States during the 12 months ending December 31, 1889, was 10,976,842 proof gallons. The figures for each form of spirits will be found in the tables.

The following summary gives the returns in proof gallons for the entire United States of the wholesale druggists and manufacturers, eleemosynary institutions, and retail apothecaries:

PROOF GALLONS OF DISTILLED SPIRITS CONSUMED IN THE ARTS, MANUFACTURES, AND MEDICINE DURING THE YEAR ENDING DECEMBER 31, 1889.

RETURNS RECEIVED FROM—	Aggregate.	Alcohol.	Cologne spirit.	High wines.	Whisky.	Brandy.	Rum.	Gin.
Total	10,976,842	6,745,152	1,453,048	75,992	2,023,900	266,874	189,581	222,295
Manufacturers and wholesale druggists	7,966,640	5,425,791	1,334,033	54,737	879,282	100,482	87,378	84,937
Eleemosynary institutions	102,790	30,092	4,374	883	59,222	6,599	841	779
Retail apothecaries	2,907,412	1,289,269	114,641	20,372	1,085,396	159,793	101,362	136,579

Table 5 gives the returns in proof gallons by totals for states of all forms of distilled spirits consumed or sold by manufacturers and wholesale druggists, eleemosynary institutions, and retail apothecaries combined.

Table 6 gives the returns of manufacturers and wholesale druggists by totals for states in ordinary gallons and in proof gallons as reported.

Table 7 gives the returns of eleemosynary institutions by totals for states in ordinary gallons and in proof gallons as reported.

Table 8 gives the returns of retail apothecaries by totals for states in ordinary gallons and in proof gallons as reported.

In converting ordinary to proof gallons the factors furnished by the internal revenue department at Washington, D. C., were used. The average strength of alcohol and of cologne spirit has been taken at 1.88, or in other words, at 88 per cent above proof; that of high wines at 1.50, or 50 per cent above proof; whisky, brandy, rum, and gin have been taken as at proof.

Attention is called to the fact that the total quantity of alcohol consumed is 6,745,152 proof gallons. According to the report of the commissioner of internal revenue for the 12 months ending June 30, 1889, 10,739,734 proof gallons of alcohol represented the total quantity withdrawn from bond on payment of the tax. Inasmuch as

only 6,745,152 proof gallons are accounted for as the result of this inquiry, it is evident that the remainder, 3,994,582 proof gallons, represents (1) a certain amount used in the arts and which has not been reported to the Census Office, and (2) a certain amount used for drinking purposes.

It has been the endeavor to obtain, as far as possible, such facts as relate to the use of alcohol as a beverage. It appears that, as such (in some cases diluted with water), it is used to a great extent by Poles, Norwegians, Swedes, Finns, Hungarians, and Russians. Inquiry of some of the large houses in the northwest familiar with this particular trade elicits the information that fully one-half of the alcohol sold in that section is used as the favorite beverage of the people mentioned above. It is estimated that about 15 barrels of alcohol are daily consumed for this purpose in New York city alone. A considerable amount is consumed by the foreign element in the coal regions of Pennsylvania.

It is impossible to obtain statistics of a reliable nature bearing upon this outlet for alcohol. It is, however, safe to assert that the quantity unaccounted for by the inquiry is largely consumed by the trade, and that the figures obtained of the quantity of alcohol consumed in the arts, manufactures, and medicine are substantially correct. If they err at all, they are probably somewhat below the truth.

TABLE 1.—COMPARATIVE STATEMENT, CHEMICALS AND ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1880 AND 1890.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital. (a)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (b)					COST OF MATERIALS USED.		
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.	Total.	Fuel.	All other materials.
				Average number.	Total wages.						
The United States	1880	1,349	$85,394,211	29,520	$11,840,704	26,776	1,493	1,251	$77,494,425	$1,882,317	$75,612,108
	1890	1,626	168,462,044	43,701	25,321,077	39,372	3,983	346	106,521,989	2,670,290	103,851,690
Alabama	c1880										
	1890	11	763,075	350	101,358	343	6	1	605,648	10,035	595,613
California	1880	42	2,400,350	573	282,614	548	16	9	2,119,078	58,391	2,060,687
	1890	36	4,293,574	832	603,465	804	22	6	2,682,848	164,170	2,518,678
Colorado	1880	2	36,000	20	18,200	18	2		49,000	1,162	47,838
	1890	6	196,300	64	48,141	63	1		401,518	2,928	398,590
Connecticut	1880	41	1,434,250	540	270,754	506	30	4	1,822,435	59,269	1,763,166
	1890	28	4,346,296	865	503,131	859	6		2,471,501	58,115	2,413,386
Delaware	1880	23	931,379	539	100,026	370	142	27	809,074	14,004	795,070
	1890	23	3,242,089	588	265,664	587	1		1,565,081	30,381	1,534,700
District of Columbia	1880	12	205,967	134	46,875	132		2	216,919	4,796	212,123
	1890	5	98,191	45	18,966	45			92,350	3,315	89,035
Florida	1880	1	700	2	315	2			500		500
	1890	3	14,705	28	9,905	28			74,075	50	74,025
Georgia	1880	4	245,000	89	28,377	82		7	209,600		209,600
	1890	49	5,706,531	1,528	527,325	1,509	12	7	3,184,670	55,751	3,128,919
Illinois	1880	52	3,348,550	1,463	571,417	1,293	72	98	5,935,430	81,171	5,854,259
	1890	86	7,833,644	1,815	1,311,991	1,638	165	12	5,196,842	80,987	5,115,855
Indiana	1880	16	102,700	73	23,116	73			89,544	3,084	86,460
	1890	19	473,852	246	152,825	190	56		572,141	7,668	564,473
Iowa	1880	17	219,600	117	34,020	108	6	3	178,710	3,535	175,175
	1890	5	68,900	35	17,820	35			35,249	1,074	34,175
Kansas	1880	12	68,000	45	12,992	43		2	128,100	1,679	126,421
	1890	3	213,428	57	32,539	52	5		65,080	3,257	61,823
Kentucky	1880	15	712,440	184	63,475	157	27		467,973	12,610	455,363
	1890	16	680,795	236	114,593	194	41	1	471,591	6,380	465,211
Louisiana	1880	7	218,701	100	45,943	87	8	5	156,007	2,000	154,007
	1890	6	707,847	158	83,605	143	15		309,941	5,849	304,092
Maine	1880	24	398,480	161	53,461	161			328,541	15,433	313,108
	1890	23	670,922	202	91,463	199	3		341,868	16,388	325,480
Maryland	1880	60	5,578,302	1,380	535,125	1,361		19	4,625,637	135,627	4,490,010
	1890	89	8,856,038	1,965	1,044,516	1,704	259	2	5,100,529	111,670	4,988,859
Massachusetts	1880	179	6,828,473	2,143	953,784	2,016	63	64	7,390,703	151,776	7,238,927
	1890	112	7,271,883	1,984	1,235,319	1,821	160	3	5,265,696	148,415	5,117,281
Michigan	1880	38	258,692	204	65,158	198	2	4	177,985	6,627	171,358
	1890	83	5,070,678	2,159	1,064,359	1,524	623	12	3,409,008	36,122	3,372,976
Minnesota	1880	6	113,500	37	19,024	30	7		115,100		115,100
	1890	9	337,314	168	85,667	105	21	42	413,193	2,016	411,177
Missouri	1880	39	3,415,300	1,174	542,769	1,114	31	29	4,056,274	79,297	3,976,977
	1890	54	5,780,161	1,320	845,281	1,138	166	16	4,182,838	80,856	4,101,982
Nebraska	1880	7	119,300	74	24,936	65	2	7	210,320	4,122	206,198
	1890	4	424,317	99	66,057	94	3	2	369,917	10,174	359,743
Nevada	1880	7	274,500	53	33,670	53			37,075		37,075
	1890	4	393,460	185	67,065	185			75,840	16,180	59,660
New Hampshire	1880	20	80,600	50	19,849	49	1		48,660		48,660
	d1890										
New Jersey	1880	62	7,371,400	2,655	1,172,654	2,345	78	232	6,088,296	239,926	5,848,370
	1890	124	19,895,868	4,621	2,936,376	4,253	352	16	11,868,432	377,663	11,490,769
New York	1880	217	20,141,586	6,251	2,901,960	5,552	429	270	20,418,018	367,943	20,050,075
	1890	290	37,207,773	10,593	6,682,971	9,188	1,321	84	26,983,638	665,667	26,317,971
North Carolina	1880	1	350,000	125	40,000	100		25	150,000		150,000
	1890	15	1,677,730	428	141,730	416	2	10	686,281	13,584	672,697
Ohio	1880	92	5,961,003	1,803	706,434	1,541	140	122	5,075,395	101,263	4,974,132
	1890	128	9,715,266	2,263	1,465,012	2,092	140	31	6,000,602	123,097	5,877,505
Oregon	1880	2	22,000	8	3,700	8			10,000		10,000
	1890	4	161,250	55	54,270	49	6		264,100	400	263,700
Pennsylvania	1880	181	18,349,930	4,796	2,151,789	4,273	336	187	13,085,892	398,596	12,687,296
	1890	248	31,741,167	7,595	4,380,165	6,961	548	86	17,303,351	466,631	16,836,720
Rhode Island	1880	41	1,291,136	687	274,657	605	74	8	1,169,202	50,711	1,118,491
	1890	16	561,303	208	145,151	204	4		531,206	20,388	510,818
South Carolina	1880	29	3,496,300	2,760	577,100	2,680	10	70	1,297,704	63,975	1,233,729
	1890	21	5,968,218	1,217	514,055	1,215	1	1	2,783,157	97,056	2,686,101
Tennessee	1880	9	127,600	65	14,406	64		1	39,114	2,324	36,790
	1890	14	698,728	182	85,403	162	20		269,546	10,200	259,346
Texas	1880	6	30,000	19	9,488	16		3	12,825		12,825
	1890	10	84,359	66	45,477	64		2	122,876	531	122,345
Vermont	1880	11	195,900	95	23,422	95			27,340	155	27,185
	1890	6	61,976	42	12,743	41	1		22,777	420	22,357
Virginia	1880	38	645,700	828	125,010	795	3	30	528,675	4,600	524,075
	1890	46	2,317,992	1,140	412,186	1,123	6	11	2,083,303	26,715	2,056,588
West Virginia	1880	9	140,900	103	32,099	93		10	73,006	8,543	64,463
	1890	8	146,800	132	45,555	131		1	110,533	4,515	106,018
Wisconsin	1880	24	251,972	163	57,397	136	14	13	320,651	9,620	311,031
	1890	17	564,010	156	82,180	139	17		297,399	9,872	287,527
All other states	1880	e3	22,000	7	3,778	7			25,642	78	25,564
	1890	f5	215,604	74	26,748	74			307,265	1,770	305,495

a Value of property hired is not included in the capital reported in 1890, because it was not included in the report of 1880.
b The figures for 1890 include officers, firm members, and clerks, while the report for 1880 states that these classes were not included at the Tenth Census.
c No reports received from this state in 1880.
d No reports received from this state in 1890.
e Embraces establishments distributed as follows: Utah, 2; Washington, 1.
f Embraces establishments distributed as follows: Arkansas, 1; Mississippi, 3; Washington, 1.

TABLE 1.—COMPARATIVE STATEMENT, CHEMICALS AND ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	PRODUCTS. Total value.	Alum. Pounds.	Alum. Value.	Fertilizers. Tons.	Fertilizers. Value.	White lead. Pounds.	White lead. Value.	Barytes. (Ground or floated.) Pounds.	Barytes. (Ground or floated.) Value.	Oxide of zinc. Pounds.	Oxide of zinc. Value.
The United States	1880	$117,377,324	39,217,725	$808,165	727,453	$19,921,400	123,477,890	$8,770,699	38,330,000	$371,829	20,121,761	$766,337
	1890	177,811,833	93,996,008	1,616,710	1,898,806	35,519,841	a143,620,471	3,297,627	43,143,000	377,939	17,648,000	695,920
Alabama	1880											
	1890	949,300			29,150	666,500						
California	1880	3,179,700			1,000	20,000	4,000,000	280,000				
	1890	5,312,313			6,100	175,500	7,000,000					
Colorado	1880	95,000										
	1890	539,910			50	1,000						
Connecticut	1880	2,419,743			7,475	248,050			12,000,000	150,000		
	1890	3,977,301			12,690	267,450			8,400,000	67,000		
Delaware	1880	1,140,086			37,917	998,165						
	1890	2,403,071			48,241	1,018,170						
District of Columbia	1880	322,439			6,300	199,000						
	1890	135,100			4,640	93,300						
Florida	1880	1,120										
	1890	86,137			3,135	86,137						
Georgia	1880	353,500			11,287	341,500						
	1890	5,209,784			230,207	4,553,709						
Illinois	1880	7,681,325			27,015	633,990	7,889,079	489,121				
	1890	8,876,391			33,819	957,718	14,827,424	404,633	200,000	12,000	400,000	16,000
Indiana	1880	156,470			1,574	44,877						
	1890	992,586			7,366	216,812						
Iowa	1880	287,743			960	13,000						
	1890	66,300			100	2,000						
Kansas	1880	186,233										
	1890	163,188										
Kentucky	1880	726,255			1,665	42,000	2,365,000	176,550				
	1890	773,867			10,268	255,116	1,381,522	4,183				
Louisiana	1880	329,659			1,823	68,106						
	1890	451,678			11,773	263,678						
Maine	1880	563,517			5,850	175,000			4,400,000	50,000		
	1890	535,267			3,998	63,570						
Maryland	1880	7,243,122			191,571	5,457,258	3,240,000	249,000				
	1890	8,243,413			366,422	6,042,442	1,580,000	82,458				
Massachusetts	1880	10,604,662			69,387	1,920,623	4,758,521	360,073				
	1890	8,679,630	2,340,000	35,000	91,502	1,922,113						
Michigan	1880	363,104			900	27,000						
	1890	6,600,191			18,715	301,025						
Minnesota	1880	220,540			600	12,000						
	1890	731,099			1,700	86,000						
Missouri	1880	5,827,498			5,905	146,932	26,400,324	1,813,600	8,850,000	100,004	660,000	29,700
	1890	6,813,484			11,496	207,806	29,003,259		19,972,000	209,000	2,400,000	101,000
Nebraska	1880	387,000			470	4,700	3,000,000	350,000				
	1890	533,315					6,585,000					
Nevada	1880	283,532										
	1890	208,300										
New Hampshire	1880	108,911										
	1890											
New Jersey	1880	9,499,577	6,378,550	91,961	80,859	2,290,202					16,774,756	654,051
	1890	19,826,774	7,191,200	134,468	169,193	3,973,112					7,348,000	293,920
New York	1880	29,805,614	3,750,000	70,000	88,336	2,636,159	28,144,009	1,951,507				
	1890	44,355,944	12,454,000	231,050	177,982	3,168,467	31,755,390	1,540,396	600,000	6,000		
North Carolina	1880	300,000			12,000	300,000						
	1890	1,079,492			54,424	938,755			4,800,000	31,600		
Ohio	1880	7,678,374			13,365	377,025	13,140,458	967,321			30,405	2,888
	1890	10,653,685			53,062	1,163,784	19,271,791				500,000	22,500
Oregon	1880	24,000										
	1890	430,000										
Pennsylvania	1880	20,884,991	29,089,175	646,204	53,507	1,432,345	30,540,499	2,153,467	3,000,000	20,000	2,656,600	79,608
	1890	28,724,441	72,012,808	1,216,192	73,946	1,603,431	32,216,085	1,265,957	291,000	1,455	7,000,000	262,500
Rhode Island	1880	1,968,041			11,979	156,427						
	1890	856,765			4,000	99,000						
South Carolina	1880	2,693,053			64,794	1,537,230						
	1890	4,527,158			293,806	4,379,033						
Tennessee	1880	121,520			314	12,670			930,000	10,685		
	1890	531,194			8,200	221,400						
Texas	1880	37,675										
	1890	199,900			33	925						
Vermont	1880	101,496										
	1890	49,698										
Virginia	1880	1,007,166			28,921	791,341			9,150,000	41,050		
	1890	3,108,800			154,497	2,407,738			8,880,000	50,884		
West Virginia	1880	209,310			629	16,300						
	1890	254,720			2,200	47,500						
Wisconsin	1880	521,388			1,050	19,500						
	1890	539,037			286	10,000						
All other states	1880	43,960										
	1890	392,600			15,805	326,650						

a Includes an intermediate product of 80,603,330 pounds for which no value is reported; for state distribution see note a, Table 2, page 292.

TABLE 1.—COMPARATIVE STATEMENT, CHEMICALS AND ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	PRODUCTS—continued.								
		Acetate of lime.		Potash and pearlash.		Soda.		Sulphuric acid.		All other products.
		Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.
The United States	1880	6,593,009	$156,892	4,571,671	$232,643	40,259,938	$866,560	308,765,432	$3,661,876	$81,820,923
	1890	26,778,415	315,430	5,106,939	197,507	333,124,375	5,432,400	a1,384,776,972	5,198,978	125,159,481
Alabama	1880									
	1890							4,000,000	20,000	262,800
California	1880							5,105,995	129,195	2,770,505
	1890					10,686,350	122,195	21,199,833	244,567	4,770,051
Colorado	1880									95,000
	1890							1,200,000	30,000	508,910
Connecticut	1880							5,163,669	53,500	1,968,193
	1890							11,000,000	61,500	3,581,351
Delaware	1880									141,921
	1890									1,384,901
District of Columbia	1880							400,000	5,000	118,439
	1890									41,800
Florida	1880									1,120
	1890									
Georgia	1880									12,000
	1890							146,942,400	126,230	529,845
Illinois	1880							4,140,000	62,000	6,496,154
	1890					14,623,392	179,500	30,690,000	170,400	7,136,140
Indiana	1880			232,500	11,625					99,968
	1890			71,375	2,855	400,000	5,000			767,919
Iowa	1880									274,743
	1890									64,300
Kansas	1880									186,233
	1890									163,188
Kentucky	1880									507,705
	1890									514,568
Louisiana	1880							1,050,000	15,750	245,803
	1890									188,000
Maine	1880			279,299	14,010			2,000,000	35,000	289,507
	1890			211,030	8,323			2,363,649	18,688	444,086
Maryland	1880	224,000	6,720					43,920,000	340,840	1,189,304
	1890					3,739,982	36,659	185,623,400	372,400	1,709,454
Massachusetts	1880	135,000	3,500					23,016,381	326,666	7,993,800
	1890					552,400	4,405	66,948,000	82,951	6,635,161
Michigan	1880	1,500,000	30,000	1,393,962	62,542			980,000	4,916	238,646
	1890	3,135,652	20,303	2,995,259	107,469			7,275,600		6,171,394
Minnesota	1880			146,000	5,840					202,700
	1890									645,099
Missouri	1880							2,880,000	57,600	3,679,572
	1890							4,200,000	49,600	6,246,078
Nebraska	1880									32,300
	1890									533,315
Nevada	1880					1,800,000	16,560	1,440,000	16,540	250,432
	1890							1,600,000	32,000	176,300
New Hampshire	1880									108,911
	1890									
New Jersey	1880	80,000	1,800					74,994,625	693,113	5,768,450
	1890					278,640	2,688	195,464,006	1,305,181	14,117,405
New York	1880	3,171,544	78,086	515,500	23,442			41,363,543	438,723	24,607,697
	1890	11,857,857	146,811	627,525	23,328	258,111,672	4,400,041	105,827,459	878,303	33,961,548
North Carolina	1880									
	1890							28,192,200	50,600	58,537
Ohio	1880			493,229	20,761			24,200,000	386,000	5,924,379
	1890			1,201,750	55,532	7,921,110	71,390	79,528,862	483,440	8,857,039
Oregon	1880									24,000
	1890									430,900
Pennsylvania	1880	1,260,000	30,650			38,459,938	850,000	66,346,819	937,522	14,735,105
	1890	11,772,906	147,616			36,810,829	610,522	211,691,163	1,008,775	22,607,993
Rhode Island	1880	45,000	2,250					9,500,000	130,000	1,679,364
	1890							12,602,000	114,378	643,387
South Carolina	1880									1,155,823
	1890							218,463,400	21,765	126,360
Tennessee	1880									98,165
	1890							7,000,000	35,000	274,794
Texas	1880									37,675
	1890									198,975
Vermont	1880	177,465	3,886							97,610
	1890									49,098
Virginia	1880							897,000	9,000	165,775
	1890							37,120,000	32,000	618,178
West Virginia	1880							1,367,400	20,511	172,499
	1890							3,240,000	30,000	177,220
Wisconsin	1880			1,511,181	94,423					407,465
	1890	12,000	700					2,600,000	31,200	497,137
All other states	1880									43,960
	1890									65,950

a Includes an intermediate product of 581,536,200 pounds for which no value is reported; for state distribution see note a, Table 2, page 296.

TABLE 2.—DETAILED STATEMENT, CHEMICALS AND

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.							
			Value of hired property.	Direct investment.						
				Aggregate.	Value of plant.				Live assets.	
					Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.
1	The United States	1,626	$12,098,037	$168,462,044	$72,640,007	$17,100,441	$26,228,463	$29,311,103	$95,822,037	$19,299,270
2	Alabama	11	8,650	763,075	198,770	14,620	81,550	102,600	564,305	31,330
3	California	36	351,235	4,293,574	2,064,802	641,700	405,587	1,017,515	2,228,772	750,370
4	Colorado	6	65,435	196,300	73,400	12,500	27,000	33,900	122,900	44,900
5	Connecticut	28	100,752	4,346,296	1,809,594	417,600	973,100	418,894	2,536,702	485,445
6	Delaware	23	34,774	3,242,089	1,248,375	300,875	645,500	302,000	1,993,714	307,400
7	District of Columbia	5	46,926	98,191	35,360	3,000	2,000	30,380	62,811	14,390
8	Florida	3	7,500	14,705	5,500	300	3,450	1,750	9,205	7,125
9	Georgia	49	87,800	5,706,531	1,780,287	255,016	836,713	688,558	3,926,244	377,632
10	Illinois	86	1,202,080	7,833,644	3,023,020	912,519	974,957	1,135,544	4,810,624	977,933
11	Indiana	19	52,200	473,852	155,096	24,090	69,821	61,185	318,756	96,109
12	Iowa	5	10,500	68,900	37,600	3,150	19,800	14,650	31,300	18,200
13	Kansas	3	.....	213,428	144,928	19,367	53,700	71,861	68,500	19,000
14	Kentucky	16	50,500	680,795	290,627	96,247	118,000	76,380	390,168	58,099
15	Louisiana	6	20,000	707,847	174,500	26,000	81,500	67,000	533,347	115,347
16	Maine	23	40,577	670,922	333,330	130,000	57,950	145,380	337,592	83,854
17	Maryland	89	600,000	8,856,038	2,660,831	585,975	1,159,600	915,256	6,195,207	670,650
18	Massachusetts	112	850,000	7,271,883	2,122,765	381,237	757,245	984,283	5,149,118	852,076
19	Michigan	83	162,902	5,070,678	1,848,847	391,655	676,735	780,457	3,221,831	737,930
20	Minnesota	9	160,000	337,314	30,210	100	100	30,010	307,104	67,430
21	Missouri	54	358,846	5,780,161	2,621,344	802,952	813,053	1,005,339	3,158,817	366,993
22	Nebraska	4	31,460	424,317	197,502	79,000	29,500	89,002	226,815	44,783
23	Nevada	4	8,500	393,460	256,368	163,470	27,500	65,398	137,092	113,000
24	New Jersey	124	1,332,570	19,895,868	9,587,281	2,286,456	3,871,631	3,429,194	10,308,587	2,438,174
25	New York	290	3,973,000	37,207,773	17,335,765	3,843,324	6,026,558	7,465,283	19,872,608	4,375,552
26	North Carolina	15	9,500	1,677,730	524,652	46,857	200,200	277,595	1,153,078	84,535
27	Ohio	128	709,875	9,715,266	4,370,238	900,364	1,780,220	1,689,654	5,345,028	1,113,470
28	Oregon	4	120,000	161,250	18,000	.....	.....	18,000	143,250	62,600
29	Pennsylvania	248	1,180,700	31,741,167	15,703,184	3,947,060	4,709,182	7,046,942	16,037,983	3,788,158
30	Rhode Island	16	200,000	561,303	239,111	51,700	79,667	107,744	322,192	57,209
31	South Carolina	21	6,330	5,968,218	2,255,289	469,400	1,065,783	720,106	3,712,929	488,938
32	Tennessee	14	14,125	698,728	312,302	69,600	149,511	93,191	386,426	90,690
33	Texas	10	15,982	84,359	41,865	4,550	26,200	11,115	42,494	22,120
34	Vermont	6	17,000	61,976	24,200	3,800	6,200	14,200	37,776	9,100
35	Virginia	46	158,073	2,317,992	730,900	144,100	356,050	230,750	1,587,092	400,085
36	West Virginia	8	56,775	146,800	85,800	10,200	28,700	46,900	61,000	25,100
37	Wisconsin	17	40,900	564,010	250,844	53,657	96,630	100,587	313,166	93,971
38	All other states (a)	5	12,570	215,604	48,100	8,000	17,600	22,500	167,504	9,572

a Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 1; Mississippi, 3; Washington, 1.

ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1890.

CAPITAL—continued.		MISCELLANEOUS EXPENSES.							
Direct investment—Continued.									
Live assets—Continued.									
Stock in process and finished products on hand.	Cash, bills and accounts receivable, and sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Amount paid to contractors.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	
$27,241,216	$49,281,551	$13,640,343	$941,660	$715,188	$874,606	$1,756,900	$24,700	$1,359,920	$7,967,369	1
38,000	494,975	51,875	950	6,210	4,640	8,575	.....	13,500	18,000	2
785,260	693,142	275,606	34,055	24,655	19,573	34,137	.....	8,958	154,228	3
23,600	54,400	14,880	6,020	520	1,620	4,025	.....	45	2,650	4
847,245	1,204,012	457,964	7,414	10,075	9,458	32,170	.....	15,807	383,040	5
724,350	961,964	71,270	2,695	7,441	9,982	28,430	.....	4,887	17,835	6
12,761	35,660	9,330	3,801	141	488	2,750	.....	600	1,550	7
180	1,900	1,059	660	4	105	10	.....	80	200	8
304,373	3,244,239	489,525	7,200	22,710	43,923	46,097	.....	142,781	226,814	9
1,610,477	2,222,214	763,990	90,156	38,104	54,636	53,849	.....	53,344	473,901	10
112,373	110,274	95,700	4,175	4,408	4,355	5,865	.....	5,708	71,189	11
8,800	4,300	2,581	929	588	913	100	.....	60	.....	12
26,000	23,500	19,749	.....	886	420	1,675	.....	1,000	15,768	13
166,084	165,985	57,619	4,149	2,918	4,904	6,372	.....	7,250	32,035	14
60,000	358,000	28,501	1,700	277	6,043	12,818	.....	4,195	3,468	15
73,550	180,188	39,172	3,181	3,757	4,054	12,586	.....	1,230	14,364	16
1,332,738	4,191,819	572,349	48,091	51,324	53,424	73,776	.....	64,152	281,582	17
1,182,856	3,114,186	722,770	59,576	41,698	56,971	85,921	.....	39,210	439,394	18
1,242,502	1,241,399	682,497	13,478	33,880	26,703	55,336	.....	51,724	501,376	19
40,503	199,081	45,752	12,600	661	2,289	1,423	.....	3,100	25,679	20
1,204,613	1,587,211	436,952	27,900	29,512	45,064	54,764	.....	36,544	243,078	21
33,586	148,446	45,967	2,800	973	1,844	1,345	.....	7,067	31,938	22
11,000	13,092	22,550	800	950	.....	3,500	.....	800	16,500	23
3,343,440	4,526,973	1,275,836	94,594	73,544	92,487	234,558	.....	116,860	663,793	24
6,022,125	9,474,931	3,909,117	317,999	196,036	183,438	459,502	19,500	346,080	2,386,562	25
67,288	1,001,255	105,407	800	9,937	7,799	15,103	.....	16,542	55,226	26
1,810,476	2,421,082	884,501	57,090	46,801	41,975	169,764	.....	54,059	574,812	27
30,150	50,500	18,495	10,800	900	2,575	1,100	.....	2,140	980	28
5,193,748	7,056,077	1,712,033	86,191	62,455	120,612	263,176	5,200	163,356	1,011,043	29
65,359	199,624	62,509	14,600	3,905	4,517	13,087	.....	600	25,850	30
426,173	2,797,818	497,535	500	17,356	45,640	98,495	.....	160,157	175,387	31
58,005	227,731	73,325	1,050	3,134	3,650	9,378	.....	12,423	43,690	32
12,074	8,300	5,911	2,254	312	745	25	.....	.....	2,575	33
13,026	15,650	5,829	1,190	185	594	600	.....	330	2,930	34
256,930	927,077	122,542	13,300	14,547	13,824	19,821	.....	19,128	41,922	35
5,100	30,800	18,583	4,500	681	1,430	1,859	.....	3,712	6,410	36
84,381	134,814	30,077	3,190	3,703	1,977	4,512	.....	1,645	15,050	37
9,000	148,932	10,985	1,200	.....	1,934	455	.....	846	6,550	38

TABLE 2.—DETAILED STATEMENT, CHEMICALS AND ALLIED

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
		Aggregates.		Officers, firm members, and clerks.		Operatives, skilled and unskilled.		Pieceworkers.	
		Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States	43,701	$25,321,077	5,953	$7,464,260	36,028	$17,193,327	1,720	$663,490
2	Alabama	350	101,358	26	21,555	318	79,403	6	400
3	California	832	603,465	67	118,338	760	475,427	5	9,700
4	Colorado	64	48,141	15	13,370	49	34,771	.....	.....
5	Connecticut	865	503,131	83	84,736	773	409,777	9	8,618
6	Delaware	588	265,664	37	30,935	549	234,654	2	75
7	District of Columbia	45	18,966	4	2,384	35	15,448	6	1,134
8	Florida	28	9,905	5	5,600	23	4,305	.....	.....
9	Georgia	1,528	527,325	175	170,782	1,353	356,543	.....	.....
10	Illinois	1,815	1,311,991	429	533,075	1,375	774,581	11	4,335
11	Indiana	246	152,825	47	60,608	197	91,545	2	672
12	Iowa	35	17,820	5	2,500	30	15,320	.....	.....
13	Kansas	57	32,539	3	3,380	54	29,159	.....	.....
14	Kentucky	236	114,593	48	43,580	161	67,058	27	3,955
15	Louisiana	158	83,605	18	32,927	140	50,678	.....	.....
16	Maine	202	91,463	30	19,486	169	71,807	3	170
17	Maryland	1,965	1,044,516	296	326,586	1,661	715,740	8	2,190
18	Massachusetts	1,984	1,235,319	273	340,929	1,676	876,425	35	17,965
19	Michigan	2,159	1,064,359	343	345,495	1,505	536,114	311	122,750
20	Minnesota	168	85,667	22	21,750	146	63,917	.....	.....
21	Missouri	1,320	845,281	204	281,890	1,106	562,991	10	400
22	Nebraska	99	66,057	22	29,340	77	36,717	.....	.....
23	Nevada	185	67,065	3	6,800	82	47,763	100	12,502
24	New Jersey	4,621	2,936,376	562	821,367	4,036	2,108,439	23	6,570
25	New York	10,593	6,682,971	1,374	2,030,690	8,563	4,407,569	656	244,703
26	North Carolina	428	141,730	42	37,177	386	104,553	.....	.....
27	Ohio	2,263	1,465,012	449	542,767	1,731	884,678	83	37,567
28	Oregon	55	54,270	17	29,650	38	24,620	.....	.....
29	Pennsylvania	7,595	4,380,165	984	1,107,375	6,233	3,097,351	378	175,439
30	Rhode Island	208	145,151	59	62,596	148	80,555	1	2,000
31	South Carolina	1,217	514,055	98	117,290	1,115	396,665	4	100
32	Tennessee	182	85,403	27	30,560	147	51,934	8	2,909
33	Texas	66	45,477	18	18,490	48	26,987	.....	.....
34	Vermont	42	12,743	8	3,412	32	9,070	2	261
35	Virginia	1,140	412,186	118	126,506	997	278,480	25	7,200
36	West Virginia	132	45,555	11	8,580	117	35,175	4	1,800
37	Wisconsin	156	82,180	20	24,245	135	57,860	1	75
38	All other states	74	26,748	11	7,500	63	19,248	.....	.....

PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

COST OF MATERIALS USED.						PRODUCTS.			
Total.	Principal materials.	Fuel.	Rent of power and heat.	Mill supplies	All other materials.	Aggregate value.	Alum. Pounds.	Alum. Value.	Coal tar products. Value	
$106,521,980	$98,917,854	$2,670,290	$42,818	$546,701	$4,344,317	$177,811,833	93,998,008	$1,616,710	$687,591	1
605,648	583,713	10,035		900	11,000	949,300				2
2,682,848	2,453,938	164,170	2,120	15,945	46,675	5,312,313				3
401,518	390,210	2,928		1,830	6,550	539,910				4
2,471,501	2,285,650	58,115		24,316	103,420	3,977,301				5
1,565,081	1,428,378	30,381		22,539	83,783	2,403,071				6
92,350	87,810	3,315	800	125	300	135,100			20,000	7
74,075	74,025	50				86,137				8
3,184,670	3,064,529	55,751		5,646	58,744	5,209,784			20,000	9
5,196,842	4,792,445	80,987	6,510	9,174	307,726	8,876,391				10
572,141	558,579	7,668	100	500	5,294	992,586				11
35,249	33,825	1,074			350	66,300				12
65,080	49,499	3,257		373	11,951	163,188				13
471,591	441,354	6,380		2,079	21,778	773,867				14
309,941	278,974	5,849		100	25,018	451,678				15
341,868	292,072	16,388	100	5,996	27,312	535,267				16
5,100,529	4,856,449	111,670	1,180	14,175	117,055	8,243,413				17
5,265,696	4,883,404	148,415	4,217	26,002	203,658	8,679,630	2,340,000	35,000	3,087	18
3,409,098	2,764,534	36,122	1,325	2,465	604,652	6,600,191				19
413,193	390,002	2,016	3,800	175	17,200	731,099				20
4,182,638	3,933,048	80,856	290	26,951	141,693	6,813,484				21
369,917	305,997	10,174			53,746	533,315				22
75,840	56,960	16,180		200	2,500	208,300				23
11,868,432	10,846,945	377,663	550	63,024	580,250	19,826,774	7,191,200	134,468	330,200	24
26,983,638	25,476,055	665,667	16,916	106,156	718,844	44,355,944	12,454,000	231,050	138,324	25
686,281	656,577	13,584		2,600	13,520	1,079,492				26
6,000,602	5,527,190	123,097	1,470	43,124	305,721	10,653,685				27
264,100	238,400	400			25,300	430,000				28
17,303,351	16,052,204	466,631	2,550	112,775	669,191	28,724,441	72,012,808	1,216,192	168,180	29
531,206	500,179	20,388	380	9,665	594	856,765				30
2,783,157	2,562,550	97,056		43,976	79,575	4,527,158				31
289,546	252,707	10,200		936	5,709	531,194			7,800	32
122,876	122,270	531			75	199,900				33
22,777	8,347	429	160	350	13,500	49,698				34
2,083,303	2,026,568	26,715	250	3,740	26,030	3,108,800				35
110,533	103,663	4,515		455	1,900	254,720				36
297,399	238,354	9,872	100	370	48,703	539,037				37
307,265	300,450	1,770		45	5,000	392,600				38

TABLE 2.—DETAILED STATEMENT, CHEMICALS AND ALLIED

	STATES AND TERRITORIES.	PRODUCTS—continued.							
		Dyeing and tanning extracts.					Explosives.		
		Total value.	Extracts.		Chipped wood and other products of this group.		Total value.	Gunpowder.	
			Pounds.	Value.	Pounds.	Value.		Pounds.	Value.
1	The United States	$8,857,084	68,537,940	$7,081,806	119,368,971	$1,775,278	$10,993,131	95,019,174	$6,740,099
2	Alabama	150,000	1,750,000	150,000			33,600		
3	California						2,504,870	3,375,000	315,000
4	Colorado								
5	Connecticut	1,883,600	480,000	1,848,000	1,530,000	35,600	867,832	8,354,640	867,832
6	Delaware						1,077,033	10,256,960	1,077,033
7	District of Columbia								
8	Florida								
9	Georgia								
10	Illinois						6,500		
11	Indiana								
12	Iowa								
13	Kansas						90,898	1,817,955	90,898
14	Kentucky								
15	Louisiana								
16	Maine	99,000	432,000	99,000			164,598	2,370,869	164,598
17	Maryland	75,763	533,000	75,763					
18	Massachusetts	1,987,256	23,323,494	1,675,214	17,309,851	312,042	240,000	1,500,000	240,000
19	Michigan						426,500		
20	Minnesota								
21	Missouri						25,500		
22	Nebraska								
23	Nevada								
24	New Jersey	567,184	1,200,000	303,000	16,159,200	264,184	1,326,252	6,389,000	405,352
25	New York	1,779,388	7,918,047	1,569,847	10,530,020	209,541	771,294	6,849,500	603,794
26	North Carolina								
27	Ohio						1,749,093	21,175,575	1,447,970
28	Oregon								
29	Pennsylvania	1,455,732	26,701,399	1,100,982	22,008,000	354,750	1,458,315	28,696,000	1,312,221
30	Rhode Island	230,000	1,200,000	60,000	7,320,000	170,000			
31	South Carolina								
32	Tennessee	2,800			150,000	2,800	142,111	2,000,000	106,666
33	Texas								
34	Vermont								
35	Virginia	512,843	5,000,000	200,000	33,188,000	312,843			
36	West Virginia	113,518			11,173,900	113,518			
37	Wisconsin						108,735	2,233,675	108,735
38	All other states								

PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.										
Explosives—Continued.		Fertilizers.								
High explosives.		Total.		From mineral phosphates.		From raw bone.		All other.		
Pounds.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	
30,626,738	$4,253,032	1,898,806	$35,519,841	1,276,708	$23,122,448	274,759	$6,620,925	347,339	$5,776,468	1
240,000	33,600	29,150	666,500	20,100	455,500	.....	.....	9,050	211,000	2
14,411,175	2,189,870	6,100	175,500	.....	.....	3,500	112,500	2,600	63,000	3
.....	.....	50	1,000	.....	.....	50	1,000	.....	.....	4
.....	.....	12,690	267,450	2,050	41,850	280	9,100	10,360	216,500	5
.....	.....	48,241	1,018,170	44,679	936,585	2,042	52,585	1,520	29,000	6
.....	.....	4,640	93,300	1,100	21,000	2,040	53,300	1,500	19,000	7
.....	.....	3,135	86,137	2,970	80,737	90	3,240	75	2,160	8
.....	.....	230,207	4,553,709	200,918	3,981,109	.....	.....	29,289	572,600	9
46,428	6,500	33,819	957,718	.....	.....	33,260	941,878	559	15,840	10
.....	.....	7,366	216,812	.....	.....	7,291	215,312	75	1,500	11
.....	.....	100	2,000	.....	.....	100	2,000	.....	.....	12
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13
.....	.....	10,268	236,116	9,090	219,060	1,100	33,670	18	2,386	14
.....	.....	11,773	263,678	1,173	28,678	4,600	115,000	6,000	120,000	15
.....	.....	3,998	63,570	375	11,250	323	9,920	3,300	42,400	16
.....	.....	366,422	6,042,442	326,676	4,978,079	20,672	473,990	47,074	590,373	17
.....	.....	91,502	1,922,113	89,350	1,672,100	2,417	70,235	8,735	179,778	18
2,301,944	426,500	18,715	301,025	.....	.....	15,015	285,375	3,700	15,650	19
.....	.....	1,700	86,000	1,700	86,000	.....	.....	.....	.....	20
150,000	25,500	11,496	207,806	.....	.....	6,958	162,926	4,538	44,880	21
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23
8,264,725	920,900	169,193	3,973,112	59,071	1,488,988	64,626	1,463,985	45,496	1,020,139	24
1,142,000	167,500	177,982	3,168,467	129,859	2,135,405	23,935	630,640	24,188	402,422	25
.....	.....	54,424	938,755	50,555	860,295	88	3,140	3,781	75,320	26
2,736,071	301,123	53,062	1,163,784	2,515	53,100	36,115	784,050	14,432	326,634	27
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28
1,125,895	146,094	73,946	1,603,431	17,058	311,394	38,294	833,004	17,694	459,033	29
.....	.....	4,000	99,000	3,000	75,000	1,000	24,000	.....	.....	30
.....	.....	293,806	4,379,033	254,869	3,759,450	2,500	60,000	36,437	559,583	31
208,500	35,445	8,200	221,400	4,000	130,000	1,650	41,500	2,550	49,900	32
.....	.....	33	925	.....	.....	33	925	.....	.....	33
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34
.....	.....	154,497	2,407,738	79,595	1,523,793	5,820	222,650	69,082	661,295	35
.....	.....	2,200	47,500	1,300	32,500	900	15,000	.....	.....	36
.....	.....	286	10,000	.....	.....	.....	.....	286	10,000	37
.....	.....	15,805	326,650	10,805	240,575	.....	.....	5,000	86,075	38

TABLE 2.—DETAILED STATEMENT, CHEMICALS AND ALLIED

PRODUCTS—continued.

	STATES AND TERRITORIES.	Paints, colors, and varnishes.							
			Pigments.						
		Total value.	White lead.		Oxide of lead.		Barytes. (Ground or floated.)		Oxide of zinc.
			Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1	The United States	$52,908,252	a143,620,471	$3,297,627	b24,662,007	$1,238,577	43,143,000	$377,939	17,648,000	$695,920
2	Alabama									
3	California	1,148,151	a7,000,000		119,043	9,523				
4	Colorado	489,620								
5	Connecticut	719,169					8,400,000	67,000		
6	Delaware	31,600								
7	District of Columbia									
8	Florida									
9	Georgia	62,000								
10	Illinois	6,071,502	a14,827,424	404,633	2,000,000	98,375	200,000	12,000	400,000	16,000
11	Indiana	438,476								
12	Iowa	58,300								
13	Kansas	37,290								
14	Kentucky	346,759	a1,381,522	4,183						
15	Louisiana	126,000								
16	Maine	45,495								
17	Maryland	411,223	1,580,000	82,458						
18	Massachusetts	1,802,181								
19	Michigan	2,039,718								
20	Minnesota	478,049								
21	Missouri	3,413,047	a29,003,259		b1,868,087	68,768	19,972,000	209,000	2,400,000	101,000
22	Nebraska	533,315	a6,585,000							
23	Nevada									
24	New Jersey	4,490,096			350,000	22,000			7,348,000	293,920
25	New York	14,745,261	31,755,390	1,540,396	7,691,486	355,753	600,000	6,000		
26	North Carolina	31,600					4,800,000	31,600		
27	Ohio	5,534,968	a19,271,791		1,249,000	62,816			500,000	22,500
28	Oregon	275,000								
29	Pennsylvania	8,848,995	a32,216,085	1,265,957	11,384,391	621,342	291,000	1,455	7,000,000	262,500
30	Rhode Island	158,417								
31	South Carolina	16,000								
32	Tennessee	72,583								
33	Texas	75,975								
34	Vermont	21,698								
35	Virginia	73,319					8,880,000	50,884		
36	West Virginia	5,000								
37	Wisconsin	241,495								
38	All other states	65,950								

a Includes an intermediate product of 80,603,330 pounds for which no value is reported, distributed as follows: California, 7,000,000 pounds; Illinois, 7,170,997 pounds; Kentucky, 1,395,460 pounds; Missouri, 29,003,259 pounds; Nebraska, 6,585,000 pounds; Ohio 19,271,791 pounds; Pennsylvania, 10,266,823 pounds.

PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.										
Paints, colors, and varnishes—Continued.										
Pigments—Continued.								Paints, varnishes, and japans.		
Lampblack and hydrocarbon blacks.		Fine colors.		Iron oxide and other earth colors.		Pulp colors. (Sold moist.)		Paints in oil, in paste.		
Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	
11,617,396	$608,800	27,215,687	$3,481,349	138,372,483	$1,068,800	10,440,763	$507,918	211,545,504	$13,448,569	1
										2
								9,254,031	758,316	3
				1,002,000	12,120					4
460,000	20,000			7,220,910	61,010			387,205	27,017	5
				120,000	3,000			322,857	22,600	6
										7
										8
				700,000	7,000			150,000	9,000	9
10,000	5,000	781,450	154,057	2,310,000	24,000		400	24,508,597	1,728,579	10
								280,000	20,900	11
				812,500	6,500			208,333	12,500	12
										13
		5,200	3,350	600,000	3,600			2,458,175	105,626	14
								760,000	51,000	15
								342,000	28,500	16
2,000	200	160,000	17,200	4,026,000	24,570	30,000	3,000	1,118,962	76,276	17
973,058	49,383	1,320,260	241,386	3,291,792	32,000	301,500	32,206	5,145,115	298,686	18
		180,000	45,400	78,000	1,170			2,550,000	170,000	19
								111,000	9,000	20
30,000	1,500	80,000	6,000	12,560,000	79,000			39,280,856	2,231,603	21
200	50	1,200	2,400					7,286,000	411,797	22
										23
180,000	9,000	8,302,564	614,547	6,000,000	55,000	1,050,000	61,700	5,990,000	257,041	24
304,238	26,436	13,933,319	2,098,989	8,344,500	144,208	3,668,390	269,998	41,438,730	1,969,135	25
										26
		365,625	43,875	10,916,580	81,049			32,615,012	2,115,874	27
								300,000	30,000	28
9,597,900	492,231	2,086,069	254,145	54,954,712	407,267	5,390,873	140,620	43,582,028	2,875,348	29
								732,500	51,900	30
										31
				16,364,000	71,183					32
								166,520	24,826	33
				4,201,480	16,898					34
				750,000	5,475					35
60,000	5,000									36
				4,120,000	33,750			2,140,917	138,045	37
								416,666	25,000	38

b Includes an intermediate product of 312,252 pounds reported for Missouri, for which no value is given.

TABLE 2.—DETAILED STATEMENT, CHEMICALS AND ALLIED

	STATES AND TERRITORIES.	PRODUCTS—continued.							
		Paints, colors, and varnishes—Continued.							
		Paints, varnishes, and japans—Continued.					Pharmaceutical preparations.	Potash and pearlash.	
		Paints, ready mixed for use.		Varnishes and japans.		Value of all other products of this group.			
		Gallons.	Value.	Gallons.	Value		Value.	Pounds.	Value.
1	The United States	12,716,101	$12,047,315	14,539,202	$13,987,268	$2,148,170	$16,744,643	5,106,939	$197,567
2	Alabama								
3	California	276,440	193,882	141,810	141,110	45,320	99,612		
4	Colorado	475,200	472,500			5,000			
5	Connecticut	13,260	18,483	215,754	383,150	142,509	33,775		
6	Delaware	7,000	6,000				10,000		
7	District of Columbia								
8	Florida								
9	Georgia	48,000	36,000	12,500	10,000		50,000		
10	Illinois	2,243,929	2,067,006	1,672,700	1,345,857	215,595	661,101		
11	Indiana	154,934	112,175	214,956	299,401	6,000	305,000	71,375	2,855
12	Iowa	31,300	39,300				6,000		
13	Kansas	40,000	37,290				35,000		
14	Kentucky	205,000	140,000	150,000	90,000		111,410		
15	Louisiana	50,000	50,000			25,000	35,000		
16	Maine	15,720	15,720			1,275	47,000	211,030	8,323
17	Maryland	139,864	144,829	46,952	58,690	4,000	911,550		
18	Massachusetts	509,330	474,663	518,034	571,392	102,471	949,000		
19	Michigan	601,472	657,769	1,783,000	1,065,000	100,379	3,035,999	2,995,259	107,469
20	Minnesota	531,499	442,499			26,550	97,050		
21	Missouri	631,400	499,120	371,309	191,606	25,450	1,115,144		
22	Nebraska	77,673	77,673			41,395			
23	Nevada								
24	New Jersey	765,784	711,093	1,823,222	2,439,795	26,000	1,839,600		
25	New York	2,312,045	2,268,863	5,107,670	5,230,718	834,765	4,031,147	627,525	23,328
26	North Carolina								
27	Ohio	2,069,350	2,062,532	1,361,840	1,006,122	120,200	585,250	1,201,750	55,532
28	Oregon	160,000	150,000			95,000	150,000		
29	Pennsylvania	1,181,121	1,122,042	1,066,555	1,098,427	307,661	2,373,848		
30	Rhode Island	65,356	64,517	16,000	20,000	22,000	4,000		
31	South Carolina	20,000	16,000						
32	Tennessee	2,000	1,000			400	25,000		
33	Texas	57,724	51,149				123,000		
34	Vermont	4,000	4,800				28,000		
35	Virginia	14,200	11,960	10,000	5,000		46,000		
36	West Virginia								
37	Wisconsin	58,000	62,500	6,900	6,000	1,200	36,157		
38	All other states	14,500	15,950	25,000	25,000				

PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.									
	Sodas.								
Total value.	Soda ash.		Sal soda.		Bicarbonate of soda.		Caustic soda.		
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	
$5,432,400	94,801,200	$1,179,720	144,641,705	$1,581,766	60,678,750	$2,009,800	33,002,720	$661,114	1
									2
122,195	1,000,000	10,000	8,407,600	98,195	1,278,750	14,000			3
									4
									5
									6
									7
									8
									9
179,500			14,623,392	179,500					10
5,000			400,000	5,000					11
									12
									13
									14
									15
									16
36,659			3,739,982	36,659					17
4,405			552,400	4,405					18
									19
									20
									21
									22
									23
2,688			278,640	2,688					24
4,400,041	92,000,000	1,150,000	91,908,952	1,017,627	51,400,000	1,800,800	22,802,720	431,614	25
									26
71,390			7,921,110	71,390					27
									28
610,522	1,801,200	19,720	16,809,629	166,302	8,000,000	195,000	10,200,000	229,500	29
									30
									31
									32
									33
									34
									35
									36
									37
									38

TABLE 2.—DETAILED STATEMENT, CHEMICALS AND ALLIED

	STATES AND TERRITORIES.	PRODUCTS—continued.						
		Sulphuric acid.						
		Total value.	50° baumé.		60° baumé.		66° baumé.	
			Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1	The United States	$5,198,978	a1,009,863,407	$1,826,572	20,379,908	$122,940	354,533,657	$3,249,466
2	Alabama	20,000	4,000,000	20,000				
3	California	244,567					21,199,833	244,567
4	Colorado	30,000					1,200,000	30,000
5	Connecticut	61,500					11,000,000	61,500
6	Delaware							
7	District of Columbia							
8	Florida							
9	Georgia	126,230	a144,846,400	100,270			2,096,000	25,960
10	Illinois	170,400	20,450,000	68,000			10,240,000	102,400
11	Indiana							
12	Iowa							
13	Kansas							
14	Kentucky							
15	Louisiana							
16	Maine	18,688	813,586	4,878	1,301,311	10,460	248,752	3,410
17	Maryland	372,400	a185,628,400	372,400				
18	Massachusetts	82,951	a57,118,300	4,740	2,728,100	11,711	7,101,660	66,500
19	Michigan		a7,275,600					
20	Minnesota							
21	Missouri	49,600					4,200,000	49,600
22	Nebraska							
23	Nevada	32,000	1,600,000	32,000				
24	New Jersey	1,305,181	a72,770,740	335,225	2,297,096	17,262	120,396,176	952,694
25	New York	878,303	35,786,000	143,787	11,812,000	68,647	58,229,459	665,869
26	North Carolina	50,600	a28,192,200	50,600				
27	Ohio	483,440	a15,000,000				64,528,862	483,440
28	Oregon							
29	Pennsylvania	1,008,775	171,698,781	593,748	2,241,401	14,920	37,750,981	400,107
30	Rhode Island	114,378	2,100,000	12,159			10,502,000	102,219
31	South Carolina	21,765	a218,463,400	21,765				
32	Tennessee	35,000	7,000,000	35,000				
33	Texas							
34	Vermont							
35	Virginia	32,000	a37,120,000	32,000				
36	West Virginia	30,000					3,240,000	30,000
37	Wisconsin	31,200					2,600,000	31,200
38	All other states							

a Includes an intermediate product of 581,536,200 pounds, for which no value is reported, distributed as follows: Georgia, 96,138,400 pounds; Maryland, 155,900,800 pounds; Massachusetts, 55,900,000 pounds; Michigan, 7,275,600 pounds; New Jersey, 5,000,000 pounds; North Carolina, 6,192,000 pounds; Ohio, 15,000,000 pounds; South Carolina, 211,009,400 pounds; Virginia, 29,120,000 pounds.

PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.									
Total value.	Wood alcohol and acetate of lime.						Value of chemicals, including all acids, bases, and salts, organic or inorganic, not heretofore enumerated.	All other products. Value.	
	Wood alcohol. (Crude.)		Wood alcohol. (Refined.)		Acetate of lime.				
	Gallons.	Value.	Gallons.	Value.	Pounds.	Value.			
$1,885,469	949,733	$613,607	917,605	$956,432	26,778,415	$315,430	$24,751,974	$13,018,253	1
								79,200	2
							818,483	198,935	3
							19,290		4
								143 975	5
							66,000	200,269	6
							21,800		7
									8
							440	397,405	9
							434,264	395,406	10
							23,443	1,000	11
									12
									13
							21,589	38,993	14
							5,000	22,000	15
							68,592	20,001	16
							77,984	315,392	17
1,600			2,000	1,600			1,495,750	156,287	18
119,186	89,806	48,733	59,008	50,150	3,135,652	20,303	116,061	454,233	19
								70,000	20
							1,523,763	478,624	21
									22
							140,700	35,600	23
50,750			50,450	50,750			4,542,685	1,264,558	24
1,215,475	405,580	267,022	755,647	801,642	11,857,857	146,811	7,172,449	5,801,417	25
1,492	2,131	1,492					18,955	38,090	26
							796,527	213,701	27
							5,000		28
475,766	426,216	283,360	44,250	44,790	11,772,906	147,616	7,216,627	2,288,058	29
							77,270	173,700	30
2,500			1,250	2,500				107,860	31
13,000	26,000	13,000						11,500	32
									33
									34
								36,900	35
							58,702		36
5,700			5,000	5,000	12,000	700	30,600	75,150	37
									38

TABLE 3.—CLASSIFICATION OF EMPLOYÉS AND WAGES, CHEMICALS

	STATES AND TERRITORIES.	AGGREGATES.			AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. Officers and firm members actively engaged in the industry or in supervision.							
					Males above 16 years.				Females above 15 years.			
		Number of establishments reporting.	Average number.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.
1	The United States	1,626	43,701	$25,321,077	2,254	47	$35.28	$3,719,009	8	44	$19.50	$6,962
2	Alabama	11	350	101,358	19	31	30.24	17,560				
3	California	36	832	603,465	32	48	46.87	71,497				
4	Colorado	6	61	48,141	9	33	26.92	8,050				
5	Connecticut	28	865	503,131	29	40	33.12	38,494	1	50	16.05	800
6	Delaware	23	588	265,664	21	35	22.92	16,835				
7	District of Columbia	5	45	18,966								
8	Florida	3	28	9,905	4	39	32.05	5,000				
9	Georgia	49	1,528	527,325	98	34	30.30	100,765				
10	Illinois	86	1,815	1,311,991	131	51	38.59	258,343				
11	Indiana	19	246	152,825	27	43	32.42	37,508				
12	Iowa	5	35	17,820	4	33	14.62	1,900				
13	Kansas	3	57	32,539	3	52	21.67	3,380				
14	Kentucky	16	236	114,593	26	47	24.12	29,339				
15	Louisiana	6	158	83,605	12	42	54.40	27,167				
16	Maine	23	202	91,463	24	40	16.87	16,396				
17	Maryland	89	1,965	1,044,516	130	45	29.31	173,143				
18	Massachusetts	112	1,984	1,235,319	141	49	30.73	210,644				
19	Michigan	83	2,159	1,064,359	83	47	27.03	104,405				
20	Minnesota	9	168	85,667	13	52	23.15	15,500				
21	Missouri	54	1,320	845,281	90	48	38.78	169,020	2	52	18.27	1,900
22	Nebraska	4	99	66,057	8	30	54.39	13,200				
23	Nevada	4	185	67,065	3	48	47.55	6,800				
24	New Jersey	124	4,621	2,936,376	201	49	46.08	452,747				
25	New York	290	10,593	6,682,971	417	50	41.30	853,447	2	48	31.47	3,000
26	North Carolina	15	428	141,730	23	37	25.93	21,911	2	27	10.01	542
27	Ohio	128	2,263	1,465,012	206	48	32.43	321,722				
28	Oregon	4	55	54,270	10	52	45.58	23,700				
29	Pennsylvania	248	7,595	4,380,165	315	48	31.54	481,283	1	52	13.85	720
30	Rhode Island	16	208	145,151	20	50	27.90	28,078				
31	South Carolina	21	1,217	514,055	37	44	39.41	63,785				
32	Tennessee	14	182	85,403	17	41	31.57	22,160				
33	Texas	10	66	45,477	11	46	24.34	12,290				
34	Vermont	6	42	12,743	8	41	10.36	3,412				
35	Virginia	46	1,140	412,186	55	45	31.82	78,728				
36	West Virginia	8	132	45,555	8	45	21.33	7,740				
37	Wisconsin	17	156	82,180	10	39	41.41	16,150				
38	All others states (a)	5	74	26,748	9	38	20.64	7,000				

a Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 1; Mississippi, 3; Washington, 1.

AND ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Clerks.								Operatives and skilled.								
Males above 16 years.				Females above 15 years.				Males above 16 years.				Females above 15 years.				
Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	
3,430	50	$21.11	$3,607,556	261	43	$11.54	$130,733	18,573	48	$11.37	$10,201,314	1,897	51	$5.69	$550,683	1
7	25	22.49	3,995					175	29	9.10	46,535					2
32	49	28.84	45,617	3	52	7.85	1,224	365	49	14.81	267,306	9	49	7.70	3,403	3
6	52	17.05	5,320					32	46	16.45	24,100	1	52	6.00	312	4
53	48	17.84	45,442					681	44	12.33	368,527	2	33	9.00	585	5
15	48	19.00	13,750	1	52	6.73	350	355	49	9.75	168,330					6
4	44	13.42	2,384					31	34	12.85	13,584					7
1	26	23.08	600					2	24	16.36	780					8
77	42	21.59	70,017					581	32	8.63	161,578	12	50	4.47	2,672	9
280	51	18.53	265,125	18	51	10.53	9,607	584	51	13.50	401,577	64	50	6.05	19,320	10
20	52	22.21	23,100					108	46	10.84	54,217	56	52	6.66	19,408	11
1	52	11.54	600					29	52	9.92	14,956					12
								42	42	14.22	25,135	5	52	2.00	520	13
18	44	15.58	12,341	4	48	9.85	1,900	110	47	9.17	47,781	6	52	3.37	1,050	14
6	43	22.34	5,760					68	34	10.14	23,144	5	52	3.96	1,030	15
6	47	11.33	3,180					140	43	10.46	63,496	3	46	3.43	468	16
154	48	20.14	149,893	12	49	6.02	3,550	1,158	49	9.91	558,242	183	52	4.27	40,605	17
112	51	21.53	122,941	20	51	7.21	7,344	959	50	11.51	546,808	79	50	5.79	22,689	18
217	52	19.31	217,254	43	52	10.66	23,836	868	51	8.52	375,905	262	51	5.95	79,748	19
8	51	14.04	5,750	1	52	9.62	500	51	51	15.31	40,016	10	51	4.67	2,396	20
97	50	21.28	102,615	15	50	11.13	8,355	390	48	13.10	245,946	49	52	6.03	15,224	21
13	49	24.69	15,620	1	52	10.00	520	54	38	14.37	29,204	1	52	7.02	365	22
								51	51	13.59	35,278					23
346	49	21.03	358,876	15	50	12.92	9,744	2,022	51	12.05	1,236,769	179	51	5.95	53,764	24
887	50	25.52	1,138,425	68	51	10.32	35,827	4,711	51	11.38	2,719,810	450	51	6.56	149,585	25
17	40	21.47	14,724					180	31	8.10	44,945					26
226	50	19.05	213,506	17	46	9.72	7,539	905	49	12.30	542,572	75	51	5.34	20,558	27
7	52	16.35	5,950					18	52	17.63	16,500	5	52	8.08	2,100	28
632	51	18.79	607,418	36	52	9.59	17,954	2,968	50	11.66	1,730,876	418	51	5.14	110,656	29
37	51	17.81	33,750	2	51	7.54	768	45	51	12.93	29,777					30
60	46	19.30	53,025	1	52	9.23	480	173	45	13.65	106,212					31
9	50	17.31	7,800	1	52	11.54	600	84	40	9.81	32,977	3	52	3.21	500	32
7	52	17.03	6,200					40	44	13.84	24,619					33
								12	40	8.44	4,095	1	52	4.33	225	34
61	46	17.00	47,178	2	46	6.59	600	388	41	7.66	122,245	4	52	4.81	1,000	35
3	45	6.25	840					99	44	7.05	30,488					36
9	45	20.00	8,060	1	5	6.46	35	66	45	11.44	34,064	15	48	3.50	2,500	37
2	26	9.62	500					28	28	16.43	12,920					38

TABLE 3.—CLASSIFICATION OF EMPLOYÉS AND WAGES, CHEMICALS AND

AVERAGE NUMBER OF EMPLOYES IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

	STATES AND TERRITORIES.	Operatives and skilled—Continued.				Unskilled.					
		Children.				Males above 16 years.				Females above 15 years.	
		Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.
1	The United States	91	48	$3.62	$15,716	14,271	48	$8.90	$6,155,294	997	50
2	Alabama	1	26	3.08	80	142	40	5.78	32,788	.....	.....
3	California	.....	.....	.....	.....	370	49	11.10	200,610	10	52
4	Colorado	.....	.....	.....	.....	16	47	13.74	10,359	.....	.....
5	Connecticut	.....	.....	.....	.....	87	47	9.73	39,989	3	52
6	Delaware	.....	.....	.....	.....	194	47	7.25	66,324	.....	.....
7	District of Columbia	.....	.....	.....	.....	4	41	11.32	1,864	.....	.....
8	Florida	.....	.....	.....	.....	21	27	6.21	3,525	.....	.....
9	Georgia	5	30	1.87	284	753	40	6.36	191,709	.....	.....
10	Illinois	9	48	4.35	1,867	640	51	10.22	334,439	75	52
11	Indiana	.....	.....	.....	.....	33	50	10.77	17,920	.....	.....
12	Iowa	.....	.....	.....	.....	1	52	7.00	364	.....	.....
13	Kansas	.....	.....	.....	.....	7	39	12.84	3,504	.....	.....
14	Kentucky	.....	.....	.....	.....	38	48	9.29	16,965	6	52
15	Louisiana	.....	.....	.....	.....	57	47	9.05	24,164	10	47
16	Maine	.....	.....	.....	.....	26	34	8.80	7,843	.....	.....
17	Maryland	2	52	1.50	156	254	47	8.81	104,839	64	52
18	Massachusetts	.....	.....	.....	.....	598	51	9.66	294,967	37	52
19	Michigan	11	52	2.26	1,290	302	50	7.92	120,526	61	52
20	Minnesota	.....	.....	.....	.....	33	52	8.15	13,933	10	52
21	Missouri	6	52	4.23	1,320	561	49	10.01	277,137	90	52
22	Nebraska	.....	.....	.....	.....	19	42	8.26	6,514	1	52
23	Nevada	.....	.....	.....	.....	31	40	10.11	12,485	.....	.....
24	New Jersey	10	92	4.88	2,540	1,683	50	9.43	789,596	136	45
25	New York	23	51	3.91	4,562	2,947	50	9.66	1,433,801	387	51
26	North Carolina	.....	.....	.....	.....	196	41	7.19	57,708	.....	.....
27	Ohio	10	46	3.13	1,422	702	49	8.96	310,988	28	48
28	Oregon	.....	.....	.....	.....	14	52	7.94	5,780	1	52
29	Pennsylvania	10	52	3.69	1,912	2,729	50	9.00	1,227,080	62	52
30	Rhode Island	.....	.....	.....	.....	101	51	9.83	50,232	2	52
31	South Carolina	1	13	2.69	35	941	48	6.40	290,418	.....	.....
32	Tennessee	.....	.....	.....	.....	46	45	6.57	13,457	14	52
33	Texas	2	13	2.62	68	6	34	11.29	2,300	.....	.....
34	Vermont	.....	.....	.....	.....	19	40	6.23	4,750	.....	.....
35	Virginia	.....	.....	.....	.....	594	41	6.32	154,285	.....	.....
36	West Virginia	1	46	3.96	180	17	41	6.43	4,507	.....	.....
37	Wisconsin	.....	.....	.....	.....	54	47	8.32	21,296	.....	.....
38	All other states	.....	.....	.....	.....	35	28	6.43	6,328	.....	.....

ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.						PIECEWORKERS—AVERAGE NUMBER EMPLOYED AND TOTAL WAGES.								
Unskilled—Continued.														
Females above 15 years—continued.		Children.				Summary.		Males above 16 years.		Females above 15 years.		Children.		
Average weekly earnings per employé.	Total wages.	Number.	Average number of weeks employed.	Average weekly earnings per employé.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
$4.74	$237,894	199	50	$3.26	$32,426	1,720	$663,490	844	$410,746	820	$245,702	56	$7,042	1
						6	400			6	400			2
5.94	3,064	6	51	3.39	1,044	5	9,700	5	9,700					3
														4
4.33	676					9	8,618	9	8,618					5
						2	75	2	75					6
						6	1,134	6	1,134					7
														8
		2	52	2.88	300									9
4.33	16,898	3	48	3.36	480	11	4,335	3	1,546	8	2,789			10
						2	672	2	672					11
														12
														13
3.79	1,184	1	52	1.50	78	27	3,955	2	830	25	3,125			14
5.02	2,340													15
						3	170	3	170					16
3.58	11,898					8	2,190	8	2,190					17
5.91	11,366	3	52	3.81	595	35	17,965	11	8,818	24	9,147			18
5.87	18,610	1	48	0.73	35	311	122,750	54	32,150	257	90,600			19
2.88	1,500	42	52	2.78	6,072									20
4.58	21,224	10	50	4.27	2,140	10	400			10	400			21
5.00	260	2	52	3.60	374									22
						100	12,502	100	12,502					23
4.07	25,170	6	50	2.01	600	23	6,570	1	150	22	6,420			24
4.75	93,247	45	51	2.84	6,564	656	244,703	226	122,990	414	119,061	16	2,652	25
		10	52	3.65	1,900									26
5.51	7,375	11	44	2.68	1,763	83	37,567	53	30,105	20	5,772	10	1,690	27
4.62	240													28
5.37	17,296	46	48	4.28	9,531	378	175,439	317	165,066	31	7,673	30	2,700	29
5.25	546					1	2,000	1	2,000					30
						4	100	4	100					31
6.67	5,000					8	2,909	6	2,669	2	240			32
														33
						2	261	2	261					34
		11	47	1.83	950	25	7,200	25	7,200					35
						4	1,800	4	1,800					36
						1	75			1	75			37
														38

TABLE 4.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY, CHEMICALS AND ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	Number of establishments reporting.	AVERAGE NUMBER OF HOURS IN ORDINARY DAY OF LABOR.		AGGREGATES.		WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)						
						Males above 16 years.						
		May to November.	November to May.	Average number.	Total wages.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.
The United States	1,626	9.94	9.84	43,701	$25,321,077	38,528	1,259	1,592	2,403	2,947	5,196	6,142
Alabama	11	9.25	10.45	350	101,358	343	55	80	123	7	.....	.....
California	36	9.82	9.66	832	603,465	799	48	2	12	32	48	40
Colorado	6	9.83	9.50	64	48,141	63	.....	1	.....	.....	1	1
Connecticut	28	9.82	9.77	865	503,131	850	38	6	25	38	12	144
Delaware	23	10.13	10.00	588	265,664	585	21	43	57	111	100	117
District of Columbia	5	10.60	10.60	45	18,966	39	.....	1	.....	6	2	14
Florida	3	10.00	10.00	28	9,905	28	.....	.....	20	1	1	2
Georgia	49	10.26	10.36	1,528	527,325	1,509	197	402	366	167	24	37
Illinois	86	9.66	9.55	1,815	1,311,991	1,635	15	10	28	40	64	258
Indiana	19	10.00	9.75	246	152,825	188	1	6	14	7	14	31
Iowa	5	10.00	10.00	35	17,820	35	.....	3	.....	1	1	3
Kansas	3	10.00	10.00	57	32,539	52	2	.....	.....	4	.....	5
Kentucky	16	10.09	9.84	236	114,593	192	20	8	8	51	8	19
Louisiana	6	10.00	10.17	158	83,605	143	6	9	9	29	6	35
Maine	23	10.22	10.13	202	91,463	196	8	6	9	22	12	38
Maryland	89	9.78	9.67	1,965	1,044,516	1,696	34	49	125	175	288	362
Massachusetts	112	9.65	9.54	1,984	1,235,319	1,810	74	27	33	194	109	413
Michigan	83	10.11	10.02	2,159	1,064,359	1,470	109	47	107	185	203	297
Minnesota	9	9.72	9.56	168	85,667	105	4	.....	4	2	29	14
Missouri	54	9.93	9.79	1,320	845,281	1,138	16	25	13	23	124	138
Nebraska	4	10.00	9.75	99	66,057	94	.....	.....	9	6	3	9
Nevada	4	9.75	9.75	185	67,065	85	.....	.....	.....	2	10	21
New Jersey	124	9.87	9.70	4,621	2,936,376	4,252	26	128	42	150	374	1,187
New York	290	9.84	9.80	10,593	6,682,971	8,962	168	148	141	363	2,215	1,328
North Carolina	15	10.17	10.10	428	141,730	416	65	29	102	83	29	12
Ohio	128	10.04	9.84	2,263	1,465,012	2,039	18	70	140	96	210	280
Oregon	4	9.75	10.00	55	54,270	49	.....	2	1	1	13	.....
Pennsylvania	248	10.11	9.96	7,595	4,380,165	6,644	96	96	155	616	1,151	1,114
Rhode Island	16	10.25	10.13	208	145,151	203	2	4	3	8	1	67
South Carolina	21	10.05	10.14	1,217	514,055	1,211	94	182	420	197	50	69
Tennessee	14	10.29	10.14	182	85,403	156	2	5	35	31	15	7
Texas	10	9.80	9.80	66	45,477	64	1	5	1	1	.....	3
Vermont	6	10.00	9.50	42	12,743	39	.....	8	5	8	14	2
Virginia	46	10.27	9.99	1,140	412,186	1,098	124	155	356	207	52	23
West Virginia	8	9.63	9.38	132	45,555	127	2	64	17	12	1	13
Wisconsin	17	9.88	9.60	156	82,180	139	3	3	7	21	12	34
All other states (b)	5	10.00	10.00	74	26,748	74	10	8	16	10	.....	2

a In comparing the table of weekly rates and number of employés at each rate with the average weekly earnings, it must be remembered that it is not Practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés reported at the respective rates.

b Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 1; Mississippi, 3; Washington, 1.

TABLE 4.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY, CHEMICALS AND ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

STATES AND TERRITORIES.	Males above 16 years—Continued.					Females above 15 years.							
	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.
The United States	6,220	4,690	3,777	1,590	2,712	3,163	1,152	709	629	248	101	113	116
Alabama		18	3	46	11								
California	120	231	158	43	65	22	6	2	4	5	1	1	1
Colorado	1	16	30	6	7	1			1				
Connecticut	178	197	123	57	32	6	2	1				2	
Delaware	73	33	9	6	15	1			1				
District of Columbia	5	6	3		2								
Florida				1	3								
Georgia	80	60	41	52	83	12	7		3	1			
Illinois	435	271	244	99	171	157	61	39	23	11	1	5	6
Indiana	39	15	17	21	23	56	6	10	15	10	10	5	
Iowa	26		1										
Kansas	13	10	7	3	5	5	5						
Kentucky	13	19	23	12	11	16	10	1	2		1	1	
Louisiana	15	11	8		15	15	5	10					
Maine	38	36	16	11		3	2	1					
Maryland	210	82	166	72	133	259	206	34	8	1	3	3	4
Massachusetts	340	271	137	68	144	136	38	40	17	26	7	1	6
Michigan	160	103	133	51	75	366	108	46	142	23	7	2	24
Minnesota	9	7	17	10	9	21	16		2		1	1	
Missouri	340	149	151	48	111	156	31	70	37	4		1	5
Nebraska	23	12	17	4	11	3		1		1			1
Nevada	25	10	8		9								
New Jersey	822	612	435	153	283	330	112	125	47	2	6	29	2
New York	1,186	1,231	1,067	338	777	907	297	175	197	87	39	40	41
North Carolina	40	16	16	11	13	2							2
Ohio	427	318	198	162	160	120	53	30	10	6	5	2	9
Oregon	1	3	7	6	15	6	1	2			1		2
Pennsylvania	1,445	819	567	226	359	517	163	119	107	69	19	18	10
Rhode Island	38	26	20	15	19	4	1	1	1			1	
South Carolina	58	28	26	19	68	1						1	
Tennessee	15	15	7	9	15	18	3		11	1			3
Texas	2	7	33	7	4								
Vermont		1	1			1	1						
Virginia	27	24	67	16	47	6	4	1		1			
West Virginia	3	4	4	6	1								
Wisconsin	11	26	6	8	8	16	14	1	1				
All other states	2	3	11	4	8								

TABLE 4.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY, CHEMICALS AND ALLIED PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

STATES AND TERRITORIES.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued								PIECEWORKERS.	
	Females above 15 years—Continued.					Children.				
	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	Average number.	Total wages.
The United States	60	24	5	6	290	249	37	4	1,720	$663,490
Alabama					1	1			6	400
California	2				6	6			5	9,700
Colorado										
Connecticut		1							9	8,618
Delaware									2	75
District of Columbia									6	1,134
Florida										
Georgia	1				7	7				
Illinois	9	1	1		12	7	3	2	11	4,335
Indiana									2	672
Iowa										
Kansas										
Kentucky		1			1	1			27	3,955
Louisiana										
Maine									3	170
Maryland					2	2			8	2,190
Massachusetts		1			3	1	2		35	17,965
Michigan	11	2	1		12	12			311	122,750
Minnesota	1				42	42				
Missouri	3	3	2		16	13	3		10	400
Nebraska					2	2				
Nevada									100	12,502
New Jersey	2	4		1	16	7	9		23	6,570
New York	21	5	1	4	68	66		2	656	244,703
North Carolina					10	10				
Ohio	1	3		1	21	21			83	37,567
Oregon										
Pennsylvania	9	3			56	36	20		378	175,439
Rhode Island									1	2,000
South Carolina					1	1			4	100
Tennessee									8	2,309
Texas					2	2				
Vermont									2	261
Virginia					11	11			25	7,200
West Virginia					1	1			4	1,800
Wisconsin									1	75
All other states										

TABLE 5.—NUMBER OF PROOF GALLONS OF ALL FORMS OF DISTILLED SPIRITS CONSUMED IN THE ARTS, MANUFACTURES, AND MEDICINE DURING THE YEAR ENDING DECEMBER 31, 1889, BY STATES AND TERRITORIES. (a)

STATES AND TERRITORIES.	Aggregate.	Alcohol.	Cologne spirit.	High wines.	Whisky.	Brandy.	Rum.	Gin.
The United States	10,976,842	6,745,152	1,458,048	75,992	2,023,900	266,874	189,581	222,295
Alabama	41,343	18,781	648	.....	19,961	714	237	1,002
Arizona	1,235	244	.....	.....	778	152	17	44
Arkansas	30,234	13,532	833	.....	12,846	1,314	50	1,659
California	294,572	170,948	74,613	7,663	29,236	6,630	1,562	3,920
Colorado	33,409	12,942	117	146	14,961	2,992	520	1,731
Connecticut	234,510	138,011	9,644	7,222	42,437	7,531	12,147	17,518
Delaware	11,063	7,949	581	15	2,012	260	49	197
District of Columbia	25,920	8,870	3,410	237	10,033	1,442	793	1,135
Florida	9,737	5,795	849	153	2,238	481	70	151
Georgia	143,153	97,668	32,236	285	11,378	857	188	541
Idaho	3,030	101	15	15	2,028	546	66	259
Illinois	1,306,332	721,552	231,190	18,698	267,022	31,383	4,552	31,935
Indiana	294,448	131,123	10,719	1,137	120,567	17,035	1,499	12,368
Indian territory	41	.....	.....	.....	20	16	.....	5
Iowa	189,962	98,354	6,525	101	74,206	5,431	898	4,447
Kansas	42,518	10,492	790	1,500	26,092	1,905	88	1,651
Kentucky	131,912	59,083	2,824	1,023	58,853	8,153	355	1,621
Louisiana	152,914	115,276	6,262	627	26,972	2,120	769	888
Maine	115,585	83,369	6,396	53	13,539	1,868	6,949	3,381
Maryland	243,051	187,209	28,154	1,983	20,096	2,039	2,718	1,752
Massachusetts	1,018,080	659,406	74,951	5,051	124,743	19,883	102,354	31,092
Michigan	494,839	356,449	20,133	117	89,688	14,513	3,288	10,651
Minnesota	183,096	125,890	13,583	216	33,794	6,268	692	2,658
Mississippi	16,231	5,493	150	.....	9,852	352	48	336
Missouri	1,071,068	655,824	120,688	1,955	253,756	22,641	2,213	13,991
Montana	6,394	4,653	9	.....	1,264	327	19	122
Nebraska	180,372	106,258	1,966	136	54,607	11,384	742	5,279
Nevada	2,118	248	.....	84	1,222	299	59	206
New Hampshire	59,465	27,133	1,057	75	16,518	2,418	7,447	4,817
New Jersey	176,175	123,909	22,922	1,338	18,372	4,868	1,335	3,431
New Mexico	3,619	500	38	.....	2,353	545	43	140
New York	1,760,343	1,107,696	366,164	18,386	197,551	29,581	10,727	24,238
North Carolina	14,661	4,841	81	.....	7,987	1,302	264	186
North Dakota	6,272	2,758	188	75	2,435	486	100	180
Ohio	647,339	412,151	37,550	1,321	162,001	16,781	3,243	14,292
Oklahoma	43	43	.....	.....	.....	.....	.....	.....
Oregon	85,917	60,732	8,135	7	12,851	2,851	244	1,097
Pennsylvania	1,142,941	703,625	305,574	1,902	102,711	14,497	5,768	8,864
Rhode Island	132,065	101,848	1,968	225	14,269	2,185	7,734	4,836
South Carolina	22,510	15,591	1,083	853	4,445	334	21	183
South Dakota	5,422	2,179	267	3	2,349	357	68	199
Tennessee	221,981	128,434	32,375	36	54,164	5,343	150	1,479
Texas	101,455	51,994	8,302	2,101	33,660	3,528	75	1,795
Utah	25,058	8,736	7,913	9	5,038	2,593	234	535
Vermont	43,412	30,744	1,820	33	7,213	751	1,653	1,198
Virginia	37,903	26,986	2,448	78	7,414	537	411	29
Washington	10,874	2,406	258	37	5,774	1,622	211	566
West Virginia	32,361	11,929	431	753	16,400	1,708	28	1,112
Wisconsin	164,728	123,675	7,150	343	25,071	5,756	813	1,920
Wyoming	3,231	1,722	38	.....	1,073	265	70	63

(a) Reported by manufacturers and wholesale druggists, eleemosynary institutions, and retail apothecaries.

TABLE 6.—RETURNS FROM MANUFACTURERS AND WHOLESALE DRUGGISTS OF DISTILLED SPIRITS USED IN THE ARTS, MANUFACTURES, AND MEDICINE IN ORDINARY GALLONS OR PROOF GALLONS, AS REPORTED DURING THE YEAR ENDING DECEMBER 31, 1889, BY STATES AND TERRITORIES.

STATES AND TERRITORIES.	ALCOHOL.		COLOGNE SPIRIT.		HIGH WINES.		WHISKY.		BRANDY.		RUM.		GIN.	
	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.
The United States	2,861,094	46,934	678,429	58,586	35,918	860	865,234	14,048	99,060	1,422	86,448	930	83,594	1,343
Alabama	6,956		301				9,360		304		64		399	
Arizona							15		15					
Arkansas	6,249		303				11,335		1,095		25		1,496	
California	85,410	3,888	30,933	12,146	4,500		6,385	51	1,008	25	410		580	
Colorado	3,884		30			89	1,193		140		35		122	
Connecticut	33,121		2,782		3,394		4,676	675	895		2,019		2,282	
Delaware	86		138				248		26		2		1	
District of Columbia	40		66								2			
Florida				125	100		300		50		25		25	
Georgia	28,915		15,358				3,270		135		18		76	
Illinois	360,972		117,306	6,272	12,088		213,807	203	22,373		3,060		26,870	
Indiana	57,831		3,882				23,851	12,075	2,833	1,230	383	256	3,218	1,213
Iowa	42,270		3,142				56,851		3,685		643		3,014	
Kansas	2,704		75		589		449		75				140	
Kentucky	25,439		980				7,675		853		65		305	
Louisiana	59,127		3,145				16,045		1,220		527		196	
Maine	34,917		2,839				2,917		504		1,895		725	
Maryland	90,684	4,315	12,554	4,487	1,296		14,139		1,309		2,061	322	1,400	42
Massachusetts	287,142		32,392		2,106		29,343		5,256		56,849		4,190	
Michigan	163,575		9,339				33,649		5,414		1,283		4,560	
Minnesota	65,044		7,142		45		22,871		3,156		302		1,583	
Mississippi	1,132		20				250		10				46	
Missouri	322,330	20,815	57,336	11,481	259	771	155,888		13,851		1,482	310	9,055	
Montana	279						40		40				5	
Nebraska	53,074		970				41,936		8,924		538		4,253	
Nevada							65		12				2	
New Hampshire	2,340		11				765		99		503		203	
New Jersey	40,743		7,260	3,591	598		505		168		204		46	
New York	392,417	12,665	173,911	6,655	9,459		42,594	102	5,757	120	4,298		4,570	
North Carolina	658						1,768		161		5			
North Dakota							76		20					
Ohio	184,306	540	16,981	496	455		84,904	439	9,416		1,865		7,551	
Oregon	30,553		4,225				200		75		10		10	
Pennsylvania	266,560		147,259	13,133	470		37,284		3,844		3,852		2,720	
Rhode Island	50,478		910				3,561		669		3,702		2,274	
South Carolina	5,298		190	177	559									
South Dakota							120		25				25	
Tennessee	63,052		16,809				19,266		2,276		113		800	
Texas	16,231		4,025				2,155		375		15		30	
Utah	2,331		1,636				1,430		701		44		106	
Vermont	5,762		21				40		15		5		5	
Virginia	9,854		837				2,396		321		50			
Washington							1,475		229		15		32	
West Virginia	4,169		168				6,066		484		10		315	
Wisconsin	49,161	4,711	3,153	23			3,994	503	1,198	47	64	42	359	88
Wyoming							77		44		5		5	

TABLE 7.—RETURNS FROM ELEEMOSYNARY INSTITUTIONS OF DISTILLED SPIRITS USED IN THE ARTS, MANUFACTURES, AND MEDICINE IN ORDINARY GALLONS OR PROOF GALLONS, AS REPORTED DURING THE YEAR ENDING DECEMBER 31, 1889, BY STATES AND TERRITORIES.

STATES AND TERRITORIES.	ALCOHOL.		COLOGNE SPIRIT.		HIGH WINES.		WHISKY.		BRANDY.		RUM.		GIN.	
	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.
The United States	14,895	2,090	2,327		589		55,275	3,947	6,597	2	841		779	
Alabama	2						164		5				2	
Arizona	15						198		11					
Arkansas	26						309							
California	736						2,296		201				60	
Colorado	11				8		682		176		30		32	
Connecticut	234		50		1		289		67		11		7	
Delaware							197		1					
District of Columbia		442	1,433				2,184		383				5	
Florida							7				1			
Georgia	13						2,411		236		108		136	
Idaho							40		10					
Illinois	1,290		244		79		1,752		281		26		57	
Indiana	10						277		39				2	
Iowa	103						128		8				2	
Kansas	22		15				126		5				1	
Kentucky	90						972	819	10					
Louisiana	39				29		1,243		174		16		21	
Maine	153						575		35		5		36	
Maryland	113				1		736	248	91		1		5	
Massachusetts	861				37		1,442		947		172		97	
Michigan	705		458		2		763		66		2		1	
Minnesota	70				20		361		109				1	
Mississippi							227		3					
Missouri	258		16		65		2,594	118	66		4		16	
Montana							29						3	
Nebraska	17		20				91		7				2	
Nevada	7						35		2		1		1	
New Hampshire	15						34		6				5	
New Jersey	234				20		1,388		410		2		68	
New Mexico							9							
New York	4,687	1,000	41		118		11,949	726	1,324		109		85	
North Carolina	8						502	1	25		1		3	
North Dakota	41						24		13				5	
Ohio	1,250				67		4,408	100	123		12		7	
Oregon	148						150		40				20	
Pennsylvania	2,595	648			10		5,107	1,291	366		5		39	
Rhode Island	47						137		74					
South Carolina	123						621		2					
South Dakota					2		1							
Tennessee					4		6,224		1,022				6	
Texas	48				106		608		62				17	
Vermont	44		55				63		10				7	
Virginia	285						2,564	644	94	2	334		13	
Washington	42				10		107		56		1		6	
West Virginia	50						292							
Wisconsin	503				10		959		37				1	

TABLE 8.—RETURNS FROM RETAIL APOTHECARIES OF DISTILLED SPIRITS USED IN THE ARTS, MANUFACTURES, AND MEDICINE IN ORDINARY GALLONS OR PROOF GALLONS, AS REPORTED DURING THE YEAR ENDING DECEMBER 31, 1889, BY STATES AND TERRITORIES.

STATES AND TERRITORIES.	ALCOHOL.		COLOGNE SPIRIT.		HIGH WINES.		WHISKY.		BRANDY.		RUM.		GIN.	
	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.	Ordinary gallons.	Proof gallons.
The United States	682,387	6,382	59,587	2,618	13,525	85	1,074,425	10,971	158,260	933	100,702	660	135,337	1,212
Alabama	2,757	517	34	18	.....	.....	9,846	591	405	.....	147	26	601	.....
Arizona	115	.....	.....	.....	.....	.....	565	.....	126	.....	17	.....	44	.....
Arkansas	923	.....	140	.....	.....	.....	1,202	.....	219	.....	25	.....	163	.....
California	2,473	456	2,294	.....	609	.....	20,454	50	5,386	10	1,147	5	3,275	5
Colorado	2,989	.....	32	.....	30	.....	12,086	1,000	2,676	.....	455	.....	1,577	.....
Connecticut	40,055	.....	2,298	.....	1,413	10	35,936	861	6,444	125	9,843	274	14,726	503
Delaware	4,142	.....	171	.....	10	.....	1,567	.....	233	.....	47	.....	196	.....
District of Columbia	4,443	.....	315	.....	158	.....	7,849	.....	1,059	.....	791	.....	1,130	.....
Florida	2,955	240	365	.....	2	.....	1,931	.....	431	.....	44	.....	126	.....
Georgia	23,023	.....	1,789	.....	190	.....	5,697	.....	484	2	62	.....	314	15
Idaho	35	35	8	.....	10	.....	1,988	.....	536	.....	66	.....	259	.....
Illinois	21,542	.....	2,034	100	298	.....	50,890	370	8,698	31	1,466	.....	5,002	6
Indiana	11,385	978	1,027	1,490	758	.....	83,232	1,132	12,865	68	860	.....	7,905	30
Indian territory	.....	.....	.....	.....	.....	.....	20	.....	16	.....	.....	.....	5	.....
Iowa	9,943	.....	329	.....	67	.....	17,227	.....	1,738	.....	255	.....	1,431	.....
Kansas	2,855	.....	330	.....	411	.....	25,517	.....	1,825	.....	88	.....	1,510	.....
Kentucky	5,898	.....	522	.....	682	.....	49,122	265	7,290	.....	290	.....	1,108	208
Louisiana	2,151	.....	186	.....	389	.....	9,684	.....	726	.....	226	.....	671	.....
Maine	9,275	.....	563	.....	35	.....	10,047	.....	1,359	.....	5,049	.....	2,610	.....
Maryland	487	.....	35	.....	25	.....	4,973	.....	639	.....	334	.....	305	.....
Massachusetts	62,681	120	7,473	5	1,224	.....	93,385	573	13,630	50	45,193	140	27,281	124
Michigan	25,294	50	917	.....	76	.....	55,188	88	8,983	50	2,003	.....	6,070	20
Minnesota	1,849	.....	83	.....	79	.....	10,498	64	2,987	16	389	1	1,036	33
Mississippi	1,790	.....	60	.....	.....	.....	9,375	.....	339	.....	48	.....	290	.....
Missouri	15,183	.....	471	500	465	.....	94,550	606	8,684	40	417	.....	4,890	30
Montana	2,196	.....	5	.....	.....	.....	1,195	.....	287	.....	19	.....	114	.....
Nebraska	3,423	12	56	.....	91	.....	12,580	.....	2,453	.....	204	.....	1,024	.....
Nevada	125	.....	.....	.....	56	.....	1,122	.....	285	.....	58	.....	203	.....
New Hampshire	11,947	245	551	.....	50	.....	15,512	207	2,261	52	6,914	30	4,547	62
New Jersey	23,770	2,185	2,996	50	274	.....	15,931	548	3,986	304	1,009	120	3,277	40
New Mexico	266	.....	20	.....	.....	.....	2,344	.....	545	.....	43	.....	140	.....
New York	184,243	1,099	17,178	185	2,630	75	139,886	2,294	22,262	118	12,267	53	19,501	82
North Carolina	1,909	.....	43	.....	.....	.....	5,716	.....	1,116	.....	258	.....	183	.....
North Dakota	1,426	.....	100	.....	50	.....	2,385	.....	453	.....	100	.....	175	.....
Ohio	33,386	.....	2,633	180	359	.....	71,805	345	7,222	20	1,356	10	6,694	40
Oklahoma	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oregon	1,603	.....	102	.....	5	.....	12,501	.....	2,736	.....	234	.....	1,067	.....
Pennsylvania	104,631	259	8,247	90	788	.....	58,360	669	10,283	4	1,910	1	6,103	2
Rhode Island	3,644	10	137	.....	150	.....	10,571	.....	1,442	.....	4,032	.....	2,562	.....
South Carolina	2,859	25	292	.....	10	.....	3,824	.....	332	.....	21	.....	183	.....
South Dakota	1,159	.....	142	.....	.....	.....	2,218	10	332	.....	68	.....	174	.....
Tennessee	5,264	.....	412	.....	20	.....	28,674	.....	2,045	.....	37	.....	673	.....
Texas	11,297	151	391	.....	1,295	.....	29,645	1,252	3,049	42	60	.....	1,727	21
Utah	2,316	.....	2,573	.....	6	.....	3,608	.....	1,892	.....	190	.....	429	.....
Vermont	10,547	.....	892	.....	22	.....	7,070	40	726	.....	1,648	.....	1,166	20
Virginia	4,215	.....	465	.....	52	.....	1,810	.....	120	.....	27	.....	16	.....
Washington	1,238	.....	137	.....	15	.....	4,192	.....	1,337	.....	195	.....	528	.....
West Virginia	2,126	.....	61	.....	502	.....	10,042	.....	1,224	.....	18	.....	797	.....
Wisconsin	13,615	.....	638	.....	219	.....	19,609	6	4,473	1	707	.....	1,471	1
Wyoming	916	.....	20	.....	.....	.....	996	.....	221	.....	65	.....	58	.....

GLASS.

GLASS.

BY JOSEPH D. WEEKS.

SCOPE OF THE REPORT.

The investigations which form the basis of this report correspond to those at the census of 1880, and are described in the monograph on the manufacture of glass for the Tenth Census, as follows: "The investigations were confined exclusively to those works which manufacture glass from the crude material, or make the 'metal', as it is termed, and do not include any statistics of those establishments in which manufactured glass is a raw material; or, in other words, this report only covers establishments in which glass is made, not those in which it is reworked, and does not, therefore, include statistics of manufactories of painted or stained glass, mirrors, chemists' ware, etc. In cases, however, where the glass is reworked in the same establishment in which it is made, as where rough plate is polished or glassware is engraved or decorated, the tables include the statistics of such reworking, it being regarded as only a part of the manufacture of glass in these works, or as having such a close relation with its manufacture as to make it practically impossible to separate the statistics of the crude from the reworked glass". The year covered by this report is the census year ending May 31, 1890.

The classification adopted in the collection of the statistics for the Eleventh Census follows the same division of the industry into four branches as that used in 1880. It is not, however, to be regarded as a complete classification of glass, but as one made necessary by the conditions of its manufacture in this country. This classification is as follows:

1. Plate glass factories, including those making rough, ribbed, or polished plate for window glass, mirrors, skylights, partitions, etc. This class also includes rolled cathedral plate.

2. Window glass factories, including those manufacturing cylinder or sheet window glass.

3. Glassware factories, including those manufacturing flint (lead or lime) glass, both blown and pressed, lamp chimneys, and flint druggists' and chemists' ware.

4. Green and black glass factories, including those producing green, black, amber, etc., bottles, fruit jars, carboys, demijohns, and other hollow ware, and green druggists' ware.

The statistical results for the industry in its entirety at the census of 1890 are summarized as follows:

SUMMARY OF GLASS MANUFACTURE: 1890.

Number of establishments reporting	294
Capital	$40,966,850
Miscellaneous expenses	$2,267,696
Average number of employés (aggregate)	45,987
Total wages	$22,118,522
Officers, firm members, and clerks:	
Average number	1,095
Total wages	$1,232,561
All other employés:	
Average number	44,892
Total wages	$20,885,961
Cost of materials used	$12,140,985
Value of products	$41,051,004
Number of furnaces	564
Number of pots in furnaces	4,932

No preceding census inquiry has comprehended data relating to the cost of manufacture other than statistics of wages and materials. The current inquiry was designed to embrace the entire cost of production other than what is involved in use of capital and plant, for interest, and depreciation.

The difference between the cost and the value shown must not, however, be taken as indicating the profit or earnings of capital, because these statistics contain no information relating to cost of selling, mercantile losses, and depreciation of plant. The census inquiry was intended to ascertain only the relations which capital, miscellaneous expenses, wages, and cost of materials used bear to the value at the works of the products of manufacturing industry, excluding all cost or expense pertaining to the mercantile portion of the business.

In the statement on the following page the data for the entire industry are distributed to the various branches which have been described, and the proportion borne to the whole industry by the respective items shown for each branch is indicated by the percentages stated.

SUMMARY SHOWING THE PERCENTAGE OF EACH ITEM TO ITS TOTAL FOR THE ENTIRE INDUSTRY, GLASS MANUFACTURE, BY BRANCHES: 1890.

ITEMS.	AGGREGATE GLASS MANUFACTURE.		PLATE GLASS.		WINDOW GLASS.		GLASSWARE.		GREEN AND BLACK GLASS.	
	Total.	Percentage.	Total.	Percentage.	Total.	Percentage.	Total.	Percentage.	Total.	Percentage.
Number of establishments reporting	294	100.00	16	5.44	84	28.57	125	42.52	69	23.47
Capital	$40,966,850	100.00	$10,233,641	24.98	$8,119,935	19.82	$15,448,196	37.71	$7,165,078	17.49
Miscellaneous expenses	$2,267,696	100.00	$510,238	22.50	$559,307	24.66	$865,115	38.15	$333,036	14.69
Average number of employés (aggregate)	45 987	100.00	4,761	10.35	7,513	16.34	23,313	50.69	10,400	22.62
Total wages	$22,118,522	100.00	$2,417,141	10.93	$5,080,874	22.97	$10,166,203	45.96	$4,454,304	20.14
Officers, firm members, and clerks:										
Average number	1,095	100.00	122	11.14	170	15.52	595	54.34	208	19.00
Total wages	$1 232,561	100.00	$170,204	13.81	$167,908	13.62	$696,647	56.52	$197,802	16.05
All other employés.										
Average number	44,892	100.00	4,639	10.33	7,343	16.36	22,718	50.61	10,192	22.70
Total wages	$20,885,961	100.00	$2,246,937	10.76	$4,912,966	23.52	$9,469,556	45.34	$4,256,502	20.38
Cost of materials used	$12,140,985	100.00	$1,894,630	15.60	$2,726,965	22.46	$4,925,234	40.57	$2,594,216	21.37
Value of products	$41,051,004	100.00	$4,869,494	11.86	$9,058,802	22.07	$18,601,244	45.31	$8,521,464	20.76
Number of furnaces	564	100.00	49	8.69	146	25.88	238	42.20	131	23.23
Number of pots in furnaces	4,932	100.00	725	14.70	1,299	26.34	2,311	46.86	597	12.10

IDLE ESTABLISHMENTS.

From the returns received it appears that 23 establishments were idle during the census year. The following statements present the data concerning these establishments, first, by totals for the United States in each branch of the industry; second, by totals for each state in the entire industry:

DETAILED STATEMENT OF IDLE ESTABLISHMENTS, GLASS MANUFACTURE, BY BRANCHES: 1890.

BRANCHES.	Number of establishments.	Capital.	Number of furnaces.	Number of pots.	Number of casting tables.	Number of annealing ovens.	Number of grinding machines.	Number of clay grinding mills.	Number of flattening ovens.	Number of glory holes.	Number of presses or pressing machines.	Number of leers.	Number of shops.	Number of grinding and engraving machines.	Number of horses.	Number of carts.	Number of drays.
Total	23	$614,748	29	239	1	78	5	3	3	23	3	12	59	18	3	2	2
Plate glass	1	9,000	1	4	1	5	1										
Window glass	5	111,800	7	68				1	3								
Glassware	9	299,126	13	116		6		1		11	3	12	19	18	1		1
Green and black glass.	8	194,822	8	51		67	4	1		12			40		2	2	1

DETAILED STATEMENT OF IDLE ESTABLISHMENTS, GLASS MANUFACTURE, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	Number of establishments.	Capital.	Number of furnaces.	Number of pots.	Number of casting tables.	Number of annealing ovens.	Number of grinding machines.	Number of clay grinding mills.	Number of flattening ovens.	Number of glory holes.	Number of presses or pressing machines.	Number of leers.	Number of shops.	Number of grinding and engraving machines.	Number of horses.	Number of carts.	Number of drays.
The United States	23	$614,748	29	239	1	78	5	3	3	23	3	12	59	18	3	2	2
Colorado	1	45,000	1	8		3				2		2		1			
Illinois	1	19,000	1	8		8				4			10				
Kansas	1	29,000	1	10				1	1								
Kentucky	2	40,000	2	12													
Massachusetts	1	25,000	4	34													
Minnesota	1	15,000															
Missouri	1	15,000	1	10		3		1		2		2	7	1	1		1
New Jersey	1	24,500	2	18													
New York	2	30,300	2	18		16	1	1					11		1	1	1
Ohio	8	217,948	12	91	1	40	3		2	15	3	8	31	16	1	1	
Pennsylvania	3	137,000	2	24													
Utah	1	17,000	1	6		8	1										

There were 23 establishments, having a capital of $591,000, with 27 furnaces containing 215 pots, reported as idle at the census of 1880; also 11 establishments in part idle, having 14 furnaces containing 134 pots entirely idle.

No inquiry was made at the census of 1890 respecting new plants in process of construction, therefore no data are available for comparison with the statistics published in the report for 1880.

The following comparative summary includes only statistics for establishments actively engaged in the production of glass as reported at both census periods:

COMPARATIVE SUMMARY, WITH PERCENTAGES OF INCREASE, GLASS MANUFACTURE, BY BRANCHES: 1880 AND 1890.

ITEMS.	Year.	AGGREGATE GLASS MANUFACTURE.		PLATE GLASS.		WINDOW GLASS.		GLASSWARE.		GREEN AND BLACK GLASS.	
		Total.	Percentage of increase.	Total.	Percentage of increase.	Total.	Percentage of increase.	Total.	Percentage of increase.	Total.	Percentage of increase.
Number of establishments reporting.	1880	169	.....	5	.....	49	.....	73	.....	42	.....
	1890	294	73.96	16	220.00	84	71.43	125	71.23	69	64.29
Capital	1880	$18,804,599	.....	$2,587,000	.....	$4,703,155	.....	$6,907,278	.....	$4,607,166	.....
	1890	$40,966,850	117.86	$10,233,641	295.58	$8,119,935	72.65	$15,448,196	123.65	$7,165,078	55.52
Miscellaneous expenses (a)	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	$2,267,696	.....	$510,238	.....	$559,307	.....	$865,115	.....	$333,036	.....
Average number of employés (aggregate). (b)	1880	24,177	.....	956	.....	3,890	.....	12,640	.....	6,691	.....
	1890	45,987	.....	4,761	.....	7,513	.....	23,313	.....	10,400	.....
Total wages	1880	$9,144,100	.....	$292,253	.....	$2,139,536	.....	$4,452,417	.....	$2,259,894	.....
	1890	$22,118,522	.....	$2,417,141	.....	$5,080,874	.....	$10,166,203	.....	$4,454,304	.....
Officers, firm members, and clerks: (c)											
Average number	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	1,095	.....	122	.....	170	.....	595	.....	208	.....
Total wages	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	$1,232,561	.....	$170,204	.....	$167,908	.....	$696,647	.....	$197,802	.....
All other employés: (c)											
Average number	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	44,892	.....	4,639	.....	7,343	.....	22,718	.....	10,192	.....
Total wages	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	$20,885,961	.....	$2,246,937	.....	$4,912,966	.....	$9,469,556	.....	$4,256,502	.....
Cost of materials used	1880	$8,028,621	.....	$438,457	.....	$1,849,530	.....	$3,292,380	.....	$2,448,254	.....
	1890	$12,140,985	51.22	$1,894,630	332.11	$2,726,905	47.44	$4,925,234	49.59	$2,594,216	5.96
Value of products	1880	$21,154,571	.....	$808,305	.....	$5,047,313	.....	$9,568,520	.....	$5,670,433	.....
	1890	$41,051,004	94.05	$4,869,494	460.80	$9,058,802	79.48	$18,601,244	94.40	$8,521,464	50.28
Number of furnaces	1880	288	.....	8	.....	76	.....	130	.....	74	.....
	1890	564	95.83	49	512.50	146	92.11	238	83.08	131	77.03
Number of pots in furnaces	1880	2,439	.....	84	.....	665	.....	1,247	.....	443	.....
	1890	4,932	102.21	725	763.10	1,299	95.34	2,311	85.32	597	34.76

a Not reported at the census of 1880.

b The schedule used at the census of 1880 called for the "total number of employés"; the schedule used at the census of 1890 called for the average number employed during the year, including officers, firm members, and clerks.

c Not reported separately at the census of 1880.

The preceding statement shows a high rate of increase during the decade, the greatest change of general conditions having occurred in the manufacture of plate glass, which has increased its capital nearly threefold, and the value of its product nearly fivefold.

A correct statement of the percentage of increase in the number of employés or the total amount of wages can not be made, because a wide difference exists in the form of inquiry used at the two census periods. At the census of 1880 the schedule of inquiry used for the glass industry called for the "total number of employés" and the "total amount of wages and earnings paid all classes of labor during the year". The schedule used at the census of 1890 called for the total wages and the "average number employed during the year", that is, the average number employed during the entire term of operation of each establishment during the census year. These data were obtained for the following classes of employés: first, operatives, engineers, and other skilled workmen, overseers, and foremen or superintendents (not general superintendents or managers); second, officers, or firm members; third, clerks; fourth, watchmen, laborers, teamsters, and other unskilled workmen; fifth, pieceworkers. The data concerning employés and wages are presented in detail in Tables 7 and 8, accompanying this report.

CAPITAL.

The different items reported as capital at the census of 1890 in the various branches of the industry are shown in detail in Tables 2, 3, 4, 5, and 6.

The total capital reported for the manufacture of all kinds of glass was distributed in the proportions to the various branches of the industry at the census periods of 1880 and 1890, respectively, as shown in the table on the following page.

STATEMENT OF RELATIVE AMOUNT OF CAPITAL TO EACH BRANCH OF GLASS MANUFACTURE: 1880 AND 1890.

BRANCHES.	CAPITAL.		PERCENTAGE OF TOTAL.	
	1880	1890	1880	1890
Total	$18,834,593	$40,966,850	100.00	100.00
Plate glass	2,587,000	10,237,641	13.76	24.98
Window glass	4,703,155	8,119,935	25.01	19.82
Glassware	6,907,278	15,448,196	36.73	37.71
Green and black glass	4,607,166	7,165,078	24.50	17.49

The average amount of capital employed to produce $1 value of product in each branch of the industry, as indicated by the results of the inquiries at the censuses of 1880 and 1890, is as follows:

AMOUNT OF CAPITAL TO PRODUCE $1 OF PRODUCT IN EACH BRANCH OF GLASS MANUFACTURE: 1880 AND 1890.

BRANCHES.	AVERAGE CAPITAL PER $1 OF PRODUCT.	
	1880	1890
Total	$0.89	$1.00
Plate glass	2.98	2.10
Window glass	0.93	0.90
Glassware	0.72	0.83
Green and black glass	0.81	0.84

The comparatively large amount of capital required to a product of one dollar in the manufacture of plate glass, $2.98 in 1880 and $2.10 in 1890, is due to the employment of costly machinery to an extent not required in the other branches of the industry and also to the necessity of carrying a large amount of glass at the works between the casting and the finishing, both of these items being reported as capital.

WAGES AND MATERIALS.

The changed proportion of cost for wages and materials used, in their relation to the value of products as reported at the two census periods, is shown by the following comparison of the percentage which each constitutes of the total value of products by the respective branches of the industry:

COMPARATIVE STATEMENT, PERCENTAGE OF WAGES AND MATERIALS USED IN THE VALUE OF PRODUCT, GLASS MANUFACTURE, BY BRANCHES: 1880 AND 1890.

BRANCHES.	PERCENTAGE OF PRODUCT.	
	1880	1890
Total:		
Wages	43.23	53.88
Materials	37.95	29.58
Plate glass:		
Wages	33.66	49.64
Materials	50.50	38.91
Window glass:		
Wages	42.39	56.09
Materials	36.64	30.10
Glassware:		
Wages	46.53	54.65
Materials	34.41	26.48
Green and black glass:		
Wages	39.85	52.27
Materials	43.18	30.44

In considering the increase shown in this statement of the percentage that wages is of product, between 1880 and 1890, attention is called to the change in the form of inquiry respecting wages.

The schedule of inquiry contained a series of questions designed to obtain the total cost of materials used in the manufacture of the products reported, and also the quantity and cost of each of the specified classes of materials. The results of the inquiry are presented under the appropriate headings of the tables for the manufacture as a whole and also for its several branches, but they should not be accepted as statements of the exact quantities and cost of the respective classes or kinds of materials, because, in some instances, the cost of the raw material is represented by the labor expended upon it. Under the head of fuel there are instances of manufacturers using natural gas who report no specific cost therefor, because it proceeds from wells on their premises, and the annual cost of labor and piping connected with its use is comprehended by replies under other heads. The following materials not specified in the tables are among those included in the column headed "All other materials": emery, cotton cloth, felt, plaster of paris, fire brick, red brick, furnace stone, iron castings, cannel coal, charcoal, wrought iron, oxide of cobalt, zaffer, beeswax, black lead, and supplies used for ordinary repair of furnace.

VALUE OF PRODUCTS.

The following table shows the relative value of the products of each branch of the industry at the census periods of 1880 and 1890, respectively:

RELATIVE VALUE OF PRODUCTS FOR EACH BRANCH OF THE GLASS MANUFACTURE: 1880 AND 1890.

BRANCHES.	VALUE OF PRODUCTS.		PERCENTAGE OF TOTAL VALUE.	
	1880	1890	1880	1890
Total	$21,154,571	$41,051,004	100.00	100.00
Plate glass	868,305	4,869,494	4.10	11.86
Window glass	5,047,313	9,058,802	23.86	22.07
Glassware	9,568,520	18,601,244	45.23	45.31
Green and black glass	5,670,433	8,521,464	26.81	20.76

The following table shows the relative productive rank of the various states in which glass was manufactured in 1880 and 1890, and the percentage which the product of each state constitutes of the total value of products in the United States:

COMPARATIVE STATEMENT, STATES RANKED ACCORDING TO VALUE OF PRODUCT IN GLASS MANUFACTURE: 1880 AND 1890.

STATES.	RANK.		VALUE OF PRODUCTS.		PERCENTAGE OF TOTAL VALUE.		STATES.	RANK.		VALUE OF PRODUCTS.		PERCENTAGE OF TOTAL VALUE.	
	1880	1890	1880	1890	1880	1890		1880	1890	1880	1890	1880	1890
The United States	.....	.....	$21,154,571	$41,051,004	100.00	100.00	Kentucky	11	11	$388,405	(a)	1.84	.....
Pennsylvania	1	1	8,720,584	17,179,137	41.22	41.85	Georgia	.....	12	.....	(a)	.....	.....
Ohio	4	2	1,549,320	5,649,182	7.32	13.76	Wisconsin	.....	13	.....	(a)	.....	.....
New Jersey	2	3	2,810,170	5,218,152	13.28	12.71	California	13	14	140,000	(a)	0.66	.....
Indiana	8	4	790,781	2,995,409	3.74	7.30	Colorado	.....	15	.....	(a)	.....	.....
New York	3	5	2,420,796	2,723,019	11.44	6.63	Delaware	.....	16	.....	(a)	.....	.....
Illinois	6	6	901,343	2,372,011	4.26	5.78	Michigan	14	17	90,000	(a)	0.43	.....
Maryland	10	7	587,000	1,256,697	2.77	3.06	Connecticut	12	.....	160,000	.....	0.76	.....
Missouri	5	8	919,827	1,215,329	4.35	2.96	New Hampshire	15	.....	70,000	.....	0.33	.....
West Virginia	9	9	748,500	945,234	3.54	2.30	Iowa	16	.....	3,500	.....	0.02	.....
Massachusetts	7	10	854,345	431,437	4.04	1.05	All other states (a)	.....	.....	.....	$1,065,397	.....	2.60

a Includes states in which less than 3 establishments were in operation during the census year 1890, so that the operations of individual establishments may not be disclosed. These establishments were distributed as follows: California, 1; Colorado, 1; Delaware, 1; Georgia, 2; Kentucky, 2; Michigan, 1; Wisconsin, 1.

To enable a complete comparison of the statistics relating to glass manufacture as reported at the censuses of 1880 and 1890, all the data common to both periods are presented in Table 1 by totals for the United States and for each state having 3 or more establishments. This table includes the number of idle establishments reported for both years, also the value of works being built in 1880.

Table 2 shows by totals for the United States and for each state having 3 or more establishments the data reported by 294 establishments which made glass during the census year 1890, and constitutes a statistical presentation of the glass manufacture in its entirety. In tables from 3 to 6, inclusive, these statistics are distributed to the different branches of the industry, namely, plate glass, window glass, glassware, and green and black glass.

PLATE GLASS.

Table 3 contains the statistics reported at the census of 1890 relating to the manufacture of plate glass by 16 establishments.

From the data reported it appears that the total value of products was $4,869,494; the total quantity of glass cast was 19,319,509 square feet. Of this quantity 3,106,831 square feet valued at $337,057 were sold in the rough state, 2,773,824 square feet valued at $279,407 were made into cathedral glass, and 9,100,111 square feet were made into polished plate valued at $4,172,484. The value of other products, consisting of opalescent glass disks, dock lights, ribbed glass, etc., was $80,546.

The quantity unaccounted for is 4,338,743 square feet, or 22.46 per cent of the total quantity cast. This represents the quantity of cast plate in process of manufacture, also of rough plate broken up and used as cullet, and also of opalescent glass disks, dock lights, ribbed glass, etc., the quantity of which was not reported. It appears that the average value per square foot of polished plate was 45.85 cents as compared with 76.20 cents in 1880; the increase in quantity of production was 773.33 per cent, while the decrease in value per square foot was 39.83 per cent.

WINDOW GLASS.

Table 4 contains the statistics reported at the census of 1890 relating to the manufacture of window glass by 84 establishments.

This table presents only the totals for the United States and for the states of Indiana, New Jersey, and Pennsylvania; the totals for Illinois, Maryland, New York, and Ohio having 3, 4, 8, and 21 establishments, respectively, in addition to other states in which there were less than 3 establishments, have been grouped in one sum. If the totals for these states were separately published in connection with similar totals for the other branches of the industry and for the entire industry, the operations of individual establishments in those branches in which there are less than 3 establishments could be identified by deducting from the totals for the entire industry, in the states named above, the totals for those branches of the industry in which there are 3 or more establishments.

It appears that the total quantity of window glass produced by the 84 establishments was 3,768,884 boxes of 50 square feet, valued at $9,037,187, or an average of $2.40 per box, as compared with $2.71 in 1880. The increase in the quantity produced is 102.11 per cent, while the increase in its value is 79.05 per cent. The decrease in the average value per box is 11.44 per cent.

GLASSWARE.

Table 5 contains statistics reported at the census of 1890 relating to the manufacture of glassware by 125 establishments.

The products of this branch of the glass industry comprise flint or lead and lime glassware, both blown and pressed; lamps and lamp chimneys, and flint druggists' and chemists' ware.

An attempt was made to ascertain the total number of pieces of certain kinds of glassware made; the data obtained are, however, far from complete and do not represent the total quantity or total value of the different classes. They may be taken as an indication of the relative values per unit of the respective classes of product, and are stated as follows:

TUMBLERS AND GOBLETS.

STATES.	Number of gross.	Value.	Average value per gross.
Ohio	453,225	$555,273	$1.24
Pennsylvania	206,800	780,059	3.77

LAMPS.

STATES.	Number of dozen.	Value.	Average value per dozen.
Ohio	66,833	$110,550	$1.65
Pennsylvania	87,058	174,900	2.01

LAMP CHIMNEYS.

STATES.	Number of dozen.	Value.	Average value per dozen.
New York	623,512	$256,541	$0.41
Ohio	4,025,120	541,836	0.13
Pennsylvania	2,885,841	1,017,639	0.35

FLINT BOTTLES, PRESCRIPTION AND FLASKS.

STATES.	Number of gross.	Value.	Average value per gross.
Illinois	12,000	$30,000	$2.50
Indiana	177,000	479,679	2.71
Maryland	170,497	509,900	2.99
New York	8,708	37,500	4.31
Ohio	65,436	151,486	2.32
Pennsylvania	823,889	2,083,952	2.53

GREEN AND BLACK GLASS.

Table 6 contains the statistics reported at the census of 1890 relating to the manufacture of green and black glass by 69 establishments.

The products of this branch of the glass industry comprise green and black bottles and vials, beer bottles, fruit jars, demijohns, carboys, telegraph insulators, and similar articles made of green or black glass.

An attempt was made to ascertain the number of pieces in certain classes of products, but the data are not complete. The totals of the returns which contained specific statements of products are as follows, but may only be taken as an indication of average values per unit and not as representing the total value or quantity of the respective classes of product.

GREEN AND BLACK BOTTLES ABOVE 8 OUNCE, NOT INCLUDING FRUIT JARS AND BEER BOTTLES.

STATES.	Number of gross.	Value.	Average value per gross.
Illinois	44,298	$225,898	$5.10
Maryland	5,600	33,000	5.89
Missouri	4,748	20,627	4.34
New Jersey	75,266	234,881	3.12
New York	19,491	90,403	4.64
Ohio	1,123	5,052	4.50
Pennsylvania	72,661	359,565	4.95

VIALS, 8 OUNCE AND UNDER.

California	10,000	37,000	3.70
Colorado	1,904	5,326	2.80
Maryland	65,350	130,700	2.00
New Jersey	343,487	665,506	1.94
New York	59,856	86,958	1.45
Ohio	3,200	9,600	3.00
Pennsylvania	206,447	194,337	0.94

BEER BOTTLES.

Illinois	127,079	597,012	4.70
Kentucky	6,000	30,000	5.00
Maryland	8,750	35,000	4.00
New Jersey	37,369	113,489	3.04
New York	25,750	96,170	3.73

FRUIT JARS.

California	2,000	18,000	9.00
Colorado	3,983	19,436	4.88
Illinois	20,750	103,798	5.00
Indiana	83,270	440,657	5.29
Kentucky	6,000	30,000	5.00
Missouri	2,093	12,939	6.18
New Jersey	33,406	181,410	5.43
New York	9,500	55,000	5.79
Ohio	60,726	296,065	4.88
Pennsylvania	47,250	233,125	4.93

The total number of carboys reported specifically was 23,416, valued at $12,925; the total number of demijohns reported was 2,139 gross, valued at $62,304.

EMPLOYÉS AND WAGES, BY CLASSES AND OCCUPATIONS.

Table 7 contains statistics showing by classes the average number of men, women, and children employed in the manufacture of glass during the census year 1890, and the average weekly earnings of each number in the respective classes, excepting pieceworkers.

It should be borne in mind that the number of hands reported is the average number employed during the year, that is, the average number having continuous employment for the full time reported by individual establishments. Upon this basis the computations are made to obtain the average weekly earnings. The average number of employés reported for each establishment is multiplied by the number of weeks embraced by its term of operation; the result is the number of weeks required for 1 employé to perform the labor. Aggregating such results of individual reports, the number of weeks required for 1 employé to perform the entire labor is obtained. This number, used as a divisor for the total wages reported, produces the true average weekly earnings.

The table includes officers, firm members, and clerks; it also shows the distribution of the average number of employés at various weekly rates of wages (excluding pieceworkers), and the average number of hours in the ordinary day of labor in the various states.

The employés as presented in Table 7 may be distributed into 3 groups. Group 1 comprises officers, firm members, and clerks; group 2 comprises all other employés receiving wages according to time; group 3 comprises all operatives paid by the "piece" or according to the quantity of production. The following statement shows the numerical proportion of each group in the whole body of employés and their relative share of the total wages:

CLASSES OF EMPLOYÉS.	Average number.	Percentage.	Total wages.	Percentage.
Total	45,987	100.00	$22,118,522	100.00
Officers, firm members, and clerks	1,095	2.38	1,232,561	5.57
Operatives, skilled and unskilled	32,461	70.59	11,856,538	53.61
Pieceworkers	12,431	27.03	9,029,423	40.82

The proportion of men, women, and children, respectively, of the whole number of employés is as follows:

CLASSES OF EMPLOYÉS.	Average number.	Percentage.
Total	45,987	100.00
Males above 16 years	37,117	80.71
Females above 15 years	1,927	4.19
Children	6,943	15.10

The schedule of inquiry called for a statement showing distinctive classes of employés according to their occupations and the rates paid in each occupation. In many of the reports from establishments having a large number of employés engaged in the same class of occupation the rates of wages vary materially in the same class and the rate reported is the average, so that in computing the general average for the respective classes the result is, to some extent, an average of average amounts, and is not therefore a true average. The same difficulty was encountered at the census of 1880, and the following remarks relating to the subject contained in the report for the Tenth Census are equally applicable now:

> However, an endeavor has been made in the accompanying tables to arrive, as nearly as may be, at the range of wages paid the different classes of labor and the average wages; and if it is distinctly understood that this is only approximate, and does not claim to be the exact average wages of the different classes, no one need be led astray by the statement.

Table 8 shows the range and average rates of daily wages of employés classified by occupations in the various branches of glass manufacture as compiled from the reports of the different establishments.

The statement on the following page shows the intervals of payment prevailing in the different branches of the industry, as indicated by the returns received. In connection with the respective intervals is stated the number of establishments reporting and the number of employés paid by them at such intervals.

STATEMENT OF INTERVALS OF PAYMENT, GLASS MANUFACTURE: 1890.

BRANCHES.	WEEKLY.		FORTNIGHTLY.		MONTHLY.		NO STATEMENT.	
	Number of establishments.	Number of employés.	Number of establishments.	Number of employés.	Number of establishments.	Number of employés.	Number of establishments.	Number of employés.
Total	308	30,311	69	11,946	13	2,766	4	964
Plate glass	4	569	8	1,984	4	2,208	.....	.....
Window glass (a)	76	6,868	1	114	5	267	2	264
Glassware (b)	83	15,686	40	6,927	.....	.....	2	700
Green and black glass	45	7,188	20	2,921	4	291	.....	.....

a Thirty-one window glass works report weekly payments and monthly settlements and 1 with fortnightly settlements.
b Six glassware works report weekly payments with monthly settlements and 4 with fortnightly settlements.

There are factory stores connected with 1 plate glass works, 8 window glass works, 2 glassware works, and 9 green and black glass works.

TABLE 1.—DETAILED COMPARATIVE STATEMENT, GLASS

	STATES AND TERRITORIES.	Year.	Number of establishments reporting. (a)	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. Aggregates. Average number.	Aggregates. Total wages.	Males above 16 years.	Females above 15 years.	Children.	MATERIALS USED. Total cost.	Mixing sand. (Tons.)	Grinding sand. (Tons.)	Soda ash. (Tons.)	Salt cake. (Tons.)	Nitrate of soda. (Tons.)	Salt. (Tons.)
1	The United States...	1880	211	$19,814,699	24,177	$9,144,100	17,778	741	5,658	$8,028,621	155,447	39,500	49,626	7,877	2,859	1,909
		1890	317	41,581,598	45,987	22,118,522	37,117	1,927	6,943	12,140,985	369,328	227,416	96,777	38,092	7,031	2,429
2	Illinois	1880	7	445,000	732	342,027	632	.....	100	297,842	9,767	.....	2,495	648	.....	611
		1890	14	1,740,878	2,793	1,232,761	2,246	20	527	682,248	23,693	.....	7,324	2,143	592	596
3	Indiana	1880	4	1,442,000	862	284,207	695	53	114	433,733	7,124	32,300	2,854	.....	.....	83
		1890	21	3,556,563	3,089	1,544,831	2,700	209	180	865,374	31,821	50,000	7,606	4,694	263	10
4	Iowa	1880	3	57,000	35	2,000	24	2	9	3,248	25	.....	10	.....	2	.....
		1890	(b)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	Kentucky	1880	5	795,000	522	150,322	364	11	147	134,101	3,543	.....	840	337	49	25
		c1890	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	Maryland	1880	8	436,000	612	234,254	524	.....	88	239,682	5,344	.....	1,902	36	36	40
		1890	11	871,111	1,413	708,736	1,061	24	328	295,337	12,703	.....	2,558	112	230	25
7	Massachusetts	1880	11	823,000	946	383,342	828	58	60	329,864	2,205	.....	392	255	75	.....
		1890	7	390,051	514	219,427	473	19	22	127,180	1,920	.....	386	157	16	.....
8	Missouri	1880	6	1,430,000	965	381,098	709	36	220	351,871	8,042	7,200	3,071	.....	31	233
		1890	6	2,216,353	1,152	596,239	1,054	1	97	557,874	11,690	22,652	4,130	180	63	173
9	New Jersey	1880	27	2,728,021	3,578	1,300,038	2,762	46	770	1,088,346	26,282	.....	8,274	1,320	120	163
		1890	35	3,769,394	5,840	2,862,719	4,741	54	1,045	1,310,953	49,278	.....	16,644	1,542	263	90
10	New York	1880	32	1,933,600	3,078	1,046,812	2,116	50	912	944,691	16,122	.....	5,865	26	194	204
		1890	32	2,327,999	3,285	1,484,039	2,641	94	550	825,498	21,050	.....	6,444	2,116	232	105
11	Ohio	1880	20	1,194,850	1,688	644,520	1,170	81	437	459,333	10,008	.....	3,244	233	332	101
		1890	67	4,312,625	6,651	3,131,578	5,258	549	844	1,602,599	54,406	.....	12,894	6,607	1,628	127
12	Pennsylvania	1880	78	7,639,706	9,784	3,897,306	6,999	294	2,491	3,350,660	61,452	.....	18,419	4,822	1,841	392
		1890	102	20,596,049	18,934	9,247,160	15,244	753	2,937	5,294,992	149,239	154,764	34,287	20,251	3,277	649
13	West Virginia	1880	4	550,522	946	311,650	615	100	231	208,064	3,183	.....	1,315	.....	179	.....
		1890	7	825,313	1,405	558,025	1,004	190	211	277,033	5,350	.....	2,209	.....	416	.....
14	All other states.....	d1880	6	370,000	429	166,524	340	10	79	187,183	2,350	.....	945	200	.....	57
		e1890	15	975,262	911	533,007	695	14	202	301,897	8,178	.....	2,293	290	51	652

a Includes idle establishments for 1880 and 1890 and those reported as building at 1880.
b None reported in 1890.

MANUFACTURE, BY STATES AND TERRITORIES: 1880 AND 1890.

MATERIALS USED—continued.

Pearlash. (Pounds.)	Litharge. (Pounds.)	Lime and quicklime. (Bushels.)	Limestone. (Tons.)	Arsenic. (Pounds.)	Manganese. (Lbs.)	Fuel. Coal. (Tons.)	Fuel. Wood. (Cords.)	Fuel. Coke. (Tons.)	Pots. (Number.)	Fire clay and pot clay. Total. (Pounds.)	Fire clay and pot clay. American. (Pounds.)	Fire clay and pot clay. English. (Pounds.)	Fire clay and pot clay. German. (Pounds.)	Lumber. (Number of M feet.)	Nails. (Kegs.)	
502. 932	2, 313, 203	869, 886	2, 597	713, 974	191, 146	646, 898	63, 867	28, 410	13, 655	17, 233, 891	9, 196, 655	110, 000	7, 927, 236	53, 585	15, 150	1
2, 544. 978	5, 501. 559	929. 706	45. 482	1. 823. 007	610, 915	723, 521	57, 857	37, 467	8, 006	37, 066, 652	23, 353, 857	1, 128, 881	12, 583, 914	102. 932	30, 262	
.....	.....	49, 607	300	26, 100	.....	35, 242	4, 212	400	627	833, 000	817, 000	.....	16, 000	2, 012	544	2
.....	40, 000	25. 525	3, 387	121. 308	14, 336	88. 576	1. 062	9, 233	498	859, 332	799, 332	.....	60. 000	4, 389	1, 860	
.....	.....	47, 842	.....	32, 000	.....	61, 050	460	71	1, 100	692, 000	662, 000	.....	30, 000	1, 767	1, 040	3
.....	.....	61. 818	6, 877	214, 100	87, 052	69. 425	500	280	701	3, 153, 600	2, 235, 600	.....	918, 000	11. 752	3. 552	
.....	.....	650	.....	.....	400	400	.....	40	1	37, 500	37, 500	.....	.....	18	10	4
20. 000	7, 000	10, 300	12	302	1. 600	12, 829	60	982	202	166. 000	165, 000	.....	1, 000	1, 115	690	5
.....	.....	62, 865	.....	2. 710	1. 500	15. 723	1. 848	.....	587	692. 000	68, 000	.....	624, 000	2, 210	593	6
77. 000	94. 000	87. 698	.....	16, 520	14. 600	30. 248	2. 726	1. 110	363	2. 487, 620	765. 420	38. 000	1. 684. 200	2, 433	1, 272	
130. 111	298. 260	2, 348	346	6, 697	9. 049	10, 899	1, 184	1. 017	150	466, 479	253. 679	60. 000	152. 800	301	148	7
74. 300	140. 750	20	390	4. 275	8. 150	11, 007	900	400	45	330. 738	18. 000	.....	312. 738	1, 549	192	
.....	.....	47, 275	360	24, 000	3. 960	36. 070	3. 203	781	601	951, 350	951. 350	.....	.....	1. 154	512	8
.....	.....	12. 916	2. 278	104. 811	56, 022	71. 750	510	17. 710	98	2, 210, 091	2. 183, 211	.....	26, 880	2, 021	777	
100	20. 000	174, 680	455	38, 453	12, 000	61, 530	29. 144	.....	2. 118	2, 880, 998	629, 000	.....	2, 251, 998	10, 529	3, 596	9
34. 035	39. 873	196, 086	3. 397	75. 256	17. 065	105, 067	18. 217	2. 412	518	3, 841. 290	1, 868, 290	290. 000	1, 683. 000	16. 923	5, 312	
142. 456	559, 257	98. 854	.....	6. 600	27, 505	52. 266	11. 247	2. 484	1. 661	1, 837. 650	242. 000	.....	1, 595. 650	5. 201	1, 698	10
500. 334	1. 213. 264	90. 502	778	52. 026	32, 489	70. 853	24. 485	2. 880	450	2. 775. 355	925. 725	392. 848	1. 456. 782	6, 966	3, 103	
24. 000	210, 000	45. 635	.....	28. 916	16. 436	54. 945	1. 488	3. 935	835	848, 025	700, 425	.....	147, 600	3, 098	670	11
335. 216	786. 991	108. 597	6. 932	375. 196	124. 581	127. 732	1. 065	890	1. 780	7, 141. 278	4. 847. 564	200. 000	2. 093. 714	14. 691	4, 464	
288. 496	1. 218. 686	309. 122	1, 124	547. 266	110. 178	278. 575	8. 996	16, 277	5. 170	6. 495. 169	3, 541. 981	26. 000	2. 927. 188	24. 834	5. 062	12
1. 474. 093	3. 086. 681	268. 674	20, 248	746. 393	216. 910	122. 771	6. 082	1. 580	3, 223	13. 086. 298	8. 931. 215	208. 033	3. 947. 050	39. 202	8. 946	
3. 769	.....	7, 533	.....	.....	8. 518	19. 319	.....	1. 923	332	933. 720	933. 720	.....	.....	838	452	13
50. 000	100. 000	14. 107	.....	89. 822	16. 450	3. 160	.....	500	170	662. 550	595. 000	.....	67. 550	1. 441	429	
.....	.....	13. 175	.....	930	.....	8. 050	2. 025	500	271	400. 000	195. 000	24. 000	181. 000	508	135	14
.....	.....	61. 763	1. 195	23. 300	23. 260	22. 932	2. 310	472	160	518. 500	184. 500	.....	334. 000	1. 565	355	

c Embraces establishments distributed as follows: California, 1; Colorado, 2; Delaware, 1; Georgia, 2; Kansas, 1; Kentucky, 4; Michigan. 1; Minnesota, 1; Utah. 1; Wisconsin, 1.

d Embraces establishments distributed as follows: California, 1; Connecticut, 1; District of Columbia, 1; Michigan, 1; Mississippi, 1; New Hampshire, 1.

TABLE 1.—DETAILED COMPARATIVE STATEMENT, GLASS

	STATES AND TERRITORIES.	Year.	MATERIALS USED—continued.		PRODUCTS.								
						Plate glass.				Window glass.		Glassware.	Green and black glass.
			Straw and hay. (Tons.)	Casks and barrels. (Number.)	Total value. (a)	Value.	Total cast. (Square feet.)	Sold rough. (Square feet.)	Polished. (Square feet.)	Value.	Boxes.	Value.	Value.
1	The United States	1880	21,298	914,619	$21,154,571	$868,305	1,700,227	377,227	1,042,900	$5,047,313	1,864,734	$9,568,520	$5,670,433
		1890	37,253	1,691,071	41,051,004	4,869,494	19,319,509	3,106,831	9,100,111	9,058,802	3,768,884	18,601,244	8,521,464
2	Illinois	1880	941	4,500	901,343					373,343	115,271		528,000
		1890	1,566	14,090	2,372,011							949,883	995,907
3	Indiana	1880	467		790,781	496,400	970,000	130,000	642,000	229,397	91,759		64,984
		1890	2,712	3,000	2,995,409	946,000	2,383,793	100,000	1,758,248	885,745	360,114	672,179	491,485
4	Iowa	1880	1	800	3,500							3,500	
		1890											
5	Kentucky	1880	1,155	400	388,405	3,512	20,684	20,684				215,330	160,563
		1890											
6	Maryland	1880	409	1,200	587,000					332,000	141,000	85,000	170,000
		1890	802	39,963	1,256,697							674,900	
7	Massachusetts	1880	325	53,475	854,345	45,843	209,543	209,543		104,002	41,886	704,500	
		1890	233	3,000	431,437	72,748	569,375	434,150					
8	Missouri	1880	617	1,500	919,827	322,550	500,000	17,000	400,000	68,000	24,000	136,487	392,790
		1890	480	840	1,215,329								
9	New Jersey	1880	3,002	31,000	2,810,170					729,155	296,685	400,000	1,681,015
		1890	4,131	600	5,218,152					1,316,170	622,432	1,235,426	2,666,556
10	New York	1880	2,328	147,977	2,420,796					540,903	216,748	1,157,571	722,322
		1890	1,990	140,315	2,723,019							1,307,156	693,666
11	Ohio	1880	1,375	86,835	1,549,320					358,000	127,122	1,076,320	115,000
		1890	6,543	376,636	5,649,182							3,554,370	519,015
12	Pennsylvania	1880	9,787	516,520	8,720,584					2,222,513	780,283	4,881,312	1,616,759
		1890	16,978	985,327	17,179,137	2,758,347	9,024,273	515,177	5,849,519	3,648,577	1,430,455	8,700,124	2,072,069
13	West Virginia	1880	754	70,312	748,500							748,500	
		1890	1,392	119,800	945,234							945,234	
14	All other states	1880	137	100	460,000					90,000	30,000	160,000	210,000
		1890	426	7,500	1,065,397	1,092,399	7,342,068	2,057,504	1,492,344	3,208,310	1,355,883	561,972	1,082,726

a While the total value for the respective states is the total value of products reported for all branches of the glass manufacture, this total can not be obtained by adding the amounts given. To avoid disclosing the operations of individual establishments it is necessary to suppress the totals for window glass in all the states except Indiana, New Jersey, and Pennsylvania; also totals for other branches of the industry in states for which less than 3 establishments are reported.

MANUFACTURE, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

	EQUIPMENT OF PLANT (NUMBER). (b)																				
Furnaces.	Pots.	Casting tables.	Annealing ovens.	Grinding machines.	Smoothing machines.	Polishing machines.	Clay grinding mills.	Flattening ovens.	Monkey ovens.	Glory holes.	Presses or pressing machines.	Leers.	Shops.	Crimping machines.	Finishing machines	Grinding and engraving machines.	Horses.	Mules.	Wagons.	Carts.	Drays.	
348	2,982	16	1,704	70	44	70	171	68	16	437	522	.....	1,353	.....	.....	716	518	231	407	187	85	1
533	5,171	63	2,220	191	28	214	156	138	19	903	804	611	2,953	233	91	816	545	48	88	211	189	
12	110	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
28	233	6	269	4	.....	.....	4	8	.....	52	2	11	125	.....	.....	1	25	.....	1	6	6	
10	108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
48	449	8	217	43	21	50	9	13	2	32	8	43	77	.....	.....	4	23	6	6	16	5	
3	28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
7	55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
10	76	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
19	161	.....	34	3	.....	.....	6	4	.....	23	4	23	148	15	50	17	21	.....	5	8	8	
22	206	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7
15	103	6	25	.....	.....	.....	2	1	.....	7	9	8	33	.....	.....	85	11	.....	2	8	1	
9	75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
14	158	23	120	26	.....	50	8	1	.....	2	.....	2	30	.....	.....	1	16	15	13	7	5	
56	377	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9
82	487	.....	352	12	.....	.....	22	22	1	199	17	50	323	.....	.....	47	122	.....	12	47	48	
48	373	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10
57	418	2	121	8	.....	.....	26	14	6	41	30	47	247	.....	.....	23	66	2	1	32	34	
29	277	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
97	807	2	163	16	.....	.....	21	27	1	145	246	150	472	57	21	274	32	.....	3	18	13	
127	1,168	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12
199	2,006	16	788	73	7	114	48	45	9	370	403	241	1,316	151	20	303	189	24	42	54	51	
8	82	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13
17	144	.....	18	2	.....	.....	3	.....	.....	24	85	33	104	10	.....	60	12	.....	3	5	4	
7	47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
17	115	.....	113	4	.....	.....	7	3	.....	8	.....	3	78	.....	.....	1	28	1	.....	10	14	

b The equipment of glass manufacturing plants other than furnaces and pots not having been reported by state totals in 1880, the comparison can be made only for the United States.

TABLE 2.—DETAILED STATEMENT, GLASS

	STATES.	CAPITAL.								
		Number of establishments reporting.	Aggregate.	Value of plant.				Live assets.			
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	294	$40,966,850	$25,437,450	$5,097,726	$11,401,021	$8,938,703	$15,529,400	$2,159,860	$6,339,196	$7,030,344
2	Illinois	13	1,721,878	1,025,171	213,900	637,334	173,937	696,707	186,287	159,022	351,398
3	Indiana	21	3,556,563	2,625,300	195,000	879,794	1,550,506	931,263	173,020	417,290	340,953
4	Maryland	11	871,111	527,192	142,000	296,692	88,500	343,919	74,561	259,358	10,000
5	Massachusetts	6	365,051	185,000	33,000	99,000	53,000	180,051	24,485	97,560	58,006
6	Missouri	5	2,201,353	1,641,153	164,159	858,000	619,000	560,194	94,950	211,519	253,725
7	New Jersey	34	3,744,894	1,858,200	239,000	1,168,200	451,000	1,886,694	250,988	737,204	898,502
8	New York	30	2,297,699	1,243,700	261,800	724,000	257,900	1,053,999	139,629	418,979	495,391
9	Ohio	59	4,094,677	2,267,212	281,522	1,369,696	615,994	1,827,465	186,872	858,627	781,966
10	Pennsylvania	99	20,459,049	13,167,174	3,377,345	4,933,615	4,856,214	7,291,875	925,989	2,901,111	3,464,775
11	West Virginia	7	825,313	377,757	33,000	213,000	131,757	447,556	36,319	144,652	266,585
12	All other states (a)	9	829,202	519,585	157,000	221,690	140,895	309,677	66,760	133,874	109,043

	STATES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.											
		Operatives, skilled and unskilled.						Pieceworkers.					
		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.	
		Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States	24,337	$10,664,728	1,626	$273,664	6,498	$918,746	11,727	$8,881,623	259	$59,181	445	$88,619
2	Illinois	1,547	628,981	20	3,860	524	62,235	668	492,545			3	430
3	Indiana	1,719	631,306	135	14,611	180	19,234	914	790,798	62	13,200		
4	Maryland	554	145,902	24	6,864	286	33,369	491	505,019			42	5,406
5	Massachusetts	352	143,341	19	3,732	12	1,500	103	51,850			10	1,200
6	Missouri	866	411,492			97	17,784	150	112,881				
7	New Jersey	2,664	1,023,503	40	8,245	1,026	114,397	1,937	1,582,295	2	160	19	1,500
8	New York	2,170	1,053,740	62	11,880	481	74,206	417	265,867	30	5,145	69	11,788
9	Ohio	3,709	1,738,097	526	71,711	824	121,992	1,344	961,939	12	2,516	20	5,000
10	Pennsylvania	10,021	4,537,074	659	127,365	2,676	422,502	4,803	3,553,852	90	27,324	261	60,403
11	West Virginia	334	140,289	127	21,796	190	29,206	636	306,060	63	10,836	21	2,892
12	All other states	401	211,003	14	3,000	202	22,321	264	258,487				

	STATES.	MATERIALS USED—continued.									
		Pearlash.		Litharge (or red lead).		Lime.		Quicklime.		Limestone.	
		Pounds.	Cost.	Pounds.	Cost.	Bushels.	Cost.	Bushels.	Cost.	Tons.	Cost.
1	The United States	2,544,978	$135,047	5,501,559	$300,096	825,237	$136,615	104,469	$13,477	45,482	$136,450
2	Illinois			40,000	2,400	25,525	3,960			3,387	13,122
3	Indiana					59,603	7,193	2,215	435	6,877	16,397
4	Maryland	77,000	3,550	94,000	4,975	36,857	1,872	50,841	2,506		
5	Massachusetts	74,300	4,458	140,750	8,445			20	6	390	937
6	Missouri					12,916	2,495			2,278	5,460
7	New Jersey	34,035	1,817	39,873	2,118	191,086	31,485	7,000	1,500	3,397	13,648
8	New York	500,334	27,237	1,213,264	73,049	66,062	16,560	24,440	4,887	778	1,824
9	Ohio	335,216	16,985	786,991	35,810	105,040	16,708	3,557	356	6,932	16,534
10	Pennsylvania	1,474,093	77,440	3,086,681	167,499	252,278	42,744	16,396	3,697	20,248	66,360
11	West Virginia	50,000	3,500	100,000	5,800	14,107	3,237				
12	All other states					61,763	10,361			1,195	2,168

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 1; Colorado, 1; Delaware, 1; Georgia, 2; Kentucky, 2; Michigan, 1; Wisconsin, 1.

MANUFACTURE, BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.						
							Aggregates.		Officers, firm members, and clerks.				
									Males above 16 years.		Females above 15 years.		
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	
$2,267,696	$70,265	$177,578	$287,850	$350,810	$412,321	$968,872	45,987	$22,118,522	1,053	$1,217,202	42	$15,359	1
134,625	.....	5,847	12,275	29,802	12,193	74,508	2,793	1,235,761	31	44,710	.....	.....	2
360,384	.....	13,637	20,915	86,302	30,230	209,300	3,089	1,544,831	67	69,680	12	6,002	3
35,847	.....	9,193	9,832	6,041	6,886	3,895	1,413	708,736	16	12,176	.....	.....	4
35,760	.....	2,811	2,560	4,309	3,970	22,110	514	219,427	18	17,774	.....	.....	5
116,397	.....	5,812	14,204	12,005	48,676	35,700	1,152	596,239	38	53,811	1	271	6
116,009	6,650	18,526	21,102	27,200	26,346	16,185	5,840	2,862,719	140	129,213	12	3,406	7
167,900	31,400	11,743	17,758	17,829	25,631	63,539	3,285	1,484,039	54	60,821	2	592	8
294,744	700	20,355	48,523	31,939	65,587	127,640	6,651	3,131,578	205	226,985	11	3,338	9
911,178	28,390	80,855	130,370	116,489	174,805	380,269	18,934	9,247,160	420	516,890	4	1,750	10
40,805	.....	4,301	4,536	8,950	1,650	21,368	1,405	558,025	34	46,946	.....	.....	11
54,047	3,125	4,498	5,775	9,944	16,347	14,358	911	533,007	30	38,196	.....	.....	12

MATERIALS USED.													
Aggregate cost.	Mixing sand.		Grinding sand.		Soda ash (carbonate of soda).		Salt cake (sulphate of soda).		Nitrate of soda.		Salt (chloride of sodium).		
	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	
$12,140,985	369,328	$899,998	227,416	$151,995	96,777	$3,108,233	38,092	$604,179	7,031	$278,291	2,429	$12,904	1
682,248	23,693	36,740	.....	.....	7,324	235,948	2,143	19,807	592	19,110	598	3,032	2
865,374	31,821	80,135	50,000	20,000	7,608	233,894	4,694	64,291	263	10,190	10	60	3
295,337	12,703	30,577	.....	.....	2,558	63,958	112	3,278	230	8,371	25	188	4
127,180	1,920	6,703	.....	.....	386	12,401	157	4,710	16	990	.....	.....	5
557,874	11,690	12,445	22,652	11,326	4,130	156,227	180	2,161	63	2,825	173	1,004	6
1,310,953	49,278	77,740	.....	.....	16,644	498,812	1,542	23,376	263	11,189	90	868	7
825,498	21,050	51,378	.....	.....	6,444	176,281	2,116	25,491	232	10,797	105	445	8
1,602,599	54,406	141,714	.....	.....	12,894	407,032	6,607	110,255	1,628	59,021	127	661	9
5,294,992	149,239	424,849	154,764	120,669	34,287	1,164,339	20,251	346,526	3,277	138,658	649	5,321	10
277,033	5,350	20,845	.....	.....	2,209	77,725	.....	.....	416	15,140	.....	.....	11
301,897	8,178	16,872	.....	.....	2,293	81,616	290	4,284	51	2,000	652	1,325	12

MATERIALS USED—continued.												
Arsenic.		Manganese.		Rouge.		Fuel.						
						Total cost.	Natural gas.	Coal.		Coke.		
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.		Cost.	Tons.	Cost.	Tons.	Cost.	
1,823,007	$61,575	610,915	$31,080	1,116,669	$64,390	$2,340,912	$780,396	723,521	$1,296,482	37,467	$59,917	1
121,308	4,209	14,336	872	.....	.....	146,834	.....	88,576	99,198	9,233	21,596	2
214,100	7,357	87,052	4,179	150,000	7,350	89,866	200	69,425	87,016	280	1,400	3
16,520	470	14,600	765	.....	.....	89,145	.....	30,248	78,112	1,110	3,142	4
4,275	131	8,150	408	.....	.....	44,691	.....	11,007	32,946	400	1,325	5
104,811	3,726	56,022	2,241	288,000	2,016	157,928	.....	71,750	154,413	17,710	2,092	6
75,256	1,979	17,065	785	.....	.....	384,951	.....	105,067	306,373	2,412	9,283	7
52,026	1,623	32,480	1,615	.....	.....	244,893	.....	70,853	203,732	2,880	11,195	8
375,196	12,937	124,581	6,577	38,000	2,870	156,404	94,063	127,732	57,189	800	1,030	9
746,393	25,780	216,910	11,932	640,669	52,154	858,281	635,135	122,771	198,841	1,580	3,969	10
89,822	2,606	16,450	985	.....	.....	54,885	51,000	3,160	2,085	500	1,800	11
23,300	757	23,260	721	.....	.....	113,034	.....	22,932	76,577	472	3,085	12

TABLE 2.—DETAILED STATEMENT, GLASS

	STATES.	MATERIALS USED—continued.							
		Fuel—Continued.				Fire clay and pot clay.			
		Wood.		Petroleum.		Total.		American.	
		Cords.	Cost.	Barrels.	Cost.	Pounds.	Cost.	Pounds.	Cost.
1	The United States	57,857	$140,926	38,660	$63,189	37,066,652	$328,903	23,353,857	$208,037
2	Illinois	1,062	2,740	11,716	23,300	859,332	7,125	799,332	6,229
3	Indiana	500	1,250			3,153,600	27,725	2,235,600	17,420
4	Maryland	2,726	7,891			2,487,620	17,164	765,420	6,314
5	Massachusetts	900	2,420	4,000	8,000	330,738	3,927	18,000	338
6	Missouri	510	1,423			2,210,091	15,232	2,183,211	15,031
7	New Jersey	18,217	67,045	1,125	2,250	3,841,290	39,554	1,868,290	14,800
8	New York	24,485	27,302	1,332	2,664	2,775,355	20,989	925,725	5,314
9	Ohio	1,065	2,547	787	1,575	7,141,278	49,672	4,847,564	32,711
10	Pennsylvania	6,082	18,686	1,100	1,650	13,086,298	139,571	8,931,215	105,481
11	West Virginia					662,550	3,345	595,000	2,745
12	All other states	2,310	9,622	18,600	23,750	518,500	4,699	184,500	1,654

	STATES.	VALUE OF PRODUCTS.					EQUIPMENT OF PLANT (NUMBER).					
		Total. (a)	Plate glass.	Window glass.	Glassware.	Green and black glass.	Furnaces.	Pots.	Casting tables.	Annealing ovens.	Grinding machines.	Smoothing machines.
1	The United States	$41,051,004	$4,869,494	$9,058,832	$18,601,244	$8,521,464	564	4,932	62	2,142	186	23
2	Illinois	2,372,011			949,883	995,907	27	225	6	269	4	
3	Indiana	2,995,409	946,000	885,745	672,179	491,485	48	449	8	217	43	21
4	Maryland	1,256,697			674,900		19	161		34	3	
5	Massachusetts	431,437	72,748				11	69	6	25		
6	Missouri	1,215,329					13	148	23	117	26	
7	New Jersey	5,218,152		1,316,170	1,235,426	2,666,556	80	469		352	12	
8	New York	2,723,019			1,307,156	693,686	55	400	2	105	7	
9	Ohio	5,649,182			3,554,370	519,015	85	806	1	123	13	
10	Pennsylvania	17,179,137	2,758,347	3,648,577	8,700,124	2,072,089	197	1,982	16	788	73	7
11	West Virginia	945,234			945,234		17	144		18	2	
12	All other states	1,065,397	1,092,399	3,208,310	561,972	1,082,726	12	79		94	3	

a While the total value for the respective states is the total value of products reported for all branches of glass manufacture, this total can not be obtained by adding the amounts given. To avoid disclosing the operations of individual establishments it is necessary to suppress the totals for window glass in all the states except Indiana, New Jersey, and Pennsylvania; also totals for other branches of the industry in states for which less than 3 establishments are reported.

MANUFACTURE, BY STATES: 1890—Continued.

MATERIALS USED—continued.

Fire clay and pot clay—Continued.				Pots, not including those made at works.		Total cost of lumber, nails, straw, hay, casks, and barrels.	Lumber, including that in boxes purchased.	Nails.	Straw and hay.	Casks and barrels.	All other materials.	
English.		German.										
Pounds.	Cost.	Pounds.	Cost.	Number.	Cost.		Cost.	Cost.	Cost.	Cost.	Cost.	
1,128,881	$11,651	12,583,914	$109,215	8,006	$393,875	$1,853,462	$1,080,937	$82,837	$274,941	$414,747	$1,289,503	1
.....	.....	60,000	896	498	31,948	78,324	62,025	4,604	7,855	3,840	78,817	2
.....	.....	918,000	10,305	701	30,055	174,827	147,899	9,656	16,272	1,000	91,420	3
38,000	338	1,684,200	10,512	363	15,275	37,220	19,048	3,310	6,070	8,792	15,933	4
.....	.....	312,738	3,589	45	1,328	19,797	13,266	681	2,350	3,500	18,248	5
.....	.....	26,880	201	98	4,740	30,957	26,187	2,093	2,589	88	147,091	6
290,000	3,857	1,683,000	20,897	518	16,724	150,530	112,260	13,711	24,414	145	53,817	7
382,848	4,082	1,456,782	11,593	450	6,905	123,681	68,394	9,129	15,138	31,020	37,843	8
200,000	1,000	2,093,714	15,961	1,780	91,884	317,906	152,811	12,523	44,773	107,799	159,278	9
298,033	2,374	3,947,050	31,716	3,223	175,444	837,633	444,240	24,455	140,045	228,893	636,095	10
.....	.....	67,550	500	170	12,222	56,400	16,230	1,300	11,200	27,670	20,443	11
.....	.....	334,000	3,045	160	7,350	26,187	18,577	1,375	4,235	2,000	30,523	12

EQUIPMENT OF PLANT (NUMBER)—continued.

Polishing machines.	Clay-grinding mills.	Flattening ovens.	Monkey ovens.	Glory holes.	Presses or pressing machines.	Leers.	Shops.	Crimping machines.	Finishing machines.	Grinding and engraving machines.	Horses.	Mules.	Wagons.	Carts.	Drays.	Cost of new construction.	
214	153	135	19	880	801	599	2,894	233	91	798	542	48	88	209	187	$606,958	1
.....	4	8	.....	48	2	11	115	.....	.....	1	25	.....	1	6	6	27,088	2
50	9	13	2	32	8	13	77	.....	.....	4	23	6	6	16	5	9,500	3
.....	6	4	.....	23	4	23	148	15	50	17	21	.....	5	8	8	12,000	4
.....	2	1	.....	7	9	8	33	.....	.....	85	11	.....	2	8	1	20,600	5
50	7	1	.....	.....	.....	.....	23	.....	.....	.....	15	15	13	7	4	81,000	6
.....	22	22	1	199	17	59	323	.....	.....	47	122	.....	12	47	48	43,759	7
.....	25	14	6	41	30	47	230	.....	.....	23	65	2	1	31	33	10,250	8
.....	21	25	1	130	243	142	441	57	21	258	31	.....	3	17	13	20,150	9
114	48	45	9	370	403	241	1,316	151	20	303	189	24	42	54	51	371,111	10
.....	3	.....	.....	24	85	33	104	10	.....	60	12	.....	3	5	4	3,850	11
.....	6	2	.....	6	.....	1	78	.....	.....	.....	28	1	.....	10	14	7,650	12

TABLE 3.—DETAILED STATEMENT,

	STATES.	Number of establishments reporting.	CAPITAL.							
			Aggregate.	Value of plant.				Live assets.			
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	16	$10,233,641	$8,202,893	$595,559	$2,811,000	$4,796,334	$2,030,748	$347,620	$824,661	$858,467
2	Indiana	3	2,174,000	1,819,000	61,000	431,000	1,277,000	355,000	60,000	173,000	122,000
3	Massachusetts	3	58,750	42,000	3,000	24,000	10,000	16,750	2,750	11,000	3,000
4	Pennsylvania	4	5,962,643	4,785,334	406,000	1,500,000	2,879,334	1,176,809	196,970	491,212	488,627
5	All other states (c)	6	2,038,248	1,556,059	120,559	806,000	629,500	482,189	87,900	149,449	244,840

	STATES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.													
		Operatives and skilled—Cont'd.				Unskilled.						Pieceworkers.			
		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.	
		Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States	50	$14,733	66	$11,808	1,246	$465,832	5	$660	14	$1,478	312	$217,349	12	$5,200	3	$430
2	Indiana	.....	.....	.....	.....	361	120,700	5	660	14	1,478	111	87,750	12	5,200	.....	.....
3	Massachusetts	.....	.....	.....	.....	58	15,994	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	Pennsylvania	50	14,733	18	4,320	514	229,256	.....	.....	.....	.....	90	66,379	.....	.....	.....	.....
5	All other states	.....	.....	48	7,488	313	99,882	.....	.....	.....	.....	111	63,220	.....	.....	3	430

	STATES.	MATERIALS USED—continued.											
		Manganese.		Rouge.		Fuel.							
						Total cost.	Natural gas.	Coal.		Coke.		Wood.	
		Pounds.	Cost.	Pounds.	Cost.		Cost.	Tons.	Cost.	Tons.	Cost.	Cords.	Cost.
1	The United States	104,822	$4,345	1,116,669	$64,390	$306,443	$85,795	118,074	$214,201	250	$1,000	2,603	$5,447
2	Indiana	42,000	1,760	150,000	7,350	63,570	.....	50,010	62,570	.....	.....	400	1,000
3	Massachusetts	5,000	250	.....	.....	13,483	.....	4,063	10,500	250	1,000	775	1,963
4	Pennsylvania	.....	.....	640,669	52,154	85,795	85,795	.....	.....	.....	.....	.....	.....
5	All other states	57,822	2,335	326,000	4,886	143,595	.....	63,981	141,131	.....	.....	1,428	2,484

	STATES.	PRODUCTS.								
		Total value.	Total cast.	Sold rough.		Polished.		Cathedral glass.		All other products.
			Square feet.	Square feet.	Value.	Square feet.	Value.	Square feet.	Value.	Value.
1	The United States	$4,869,494	19,319,509	3,106,831	$337,057	9,100,111	$4,172,484	2,773,824	$279,407	$80,546
2	Indiana	946,000	2,383,793	100,000	20,000	1,758,248	886,000	.....	.....	40,000
3	Massachusetts	72,748	569,375	434,150	59,025	.....	.....	.....	.....	13,723
4	Pennsylvania	2,758,317	9,024,273	515,177	82,232	5,849,519	2,676,115	.....	.....	.....
5	All other states	1,092,399	7,342,068	2,057,504	175,800	1,492,344	610,369	2,773,824	279,407	26,823

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Illinois, 2; Missouri, 2; New York, 1; Ohio, 1.

PLATE GLASS, BY STATES: 1890.

MISCELLANEOUS EXPENSES.						AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.										
Total.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Aggregates.		Officers or firm members actively engaged in the industry or in supervision.		Clerks.				Operatives and skilled.		
								Males above 16 years.		Males above 16 years.		Females above 15 years.		Males above 16 years.		
						Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
$510,238	$23,502	$39,368	$43,500	$132,683	$271,185	4,761	$2,417,141	33	$104,600	79	$60,573	10	$5,031	2,931	$1,529,447	1
174,600	5,550	6,800	32,250	500	129,500	786	405,388	8	14,000	13	7,443	8	4,160	254	164,000	2
2,112	650	512	950	.....	.....	87	27,852	.....	.....	3	1,250	.....	.....	26	10,608	3
222,949	13,016	18,808	500	86,950	103,585	2,839	1,466,503	12	54,500	36	33,342	1	600	2,118	1,063,373	4
110,577	4,286	13,158	9,800	45,233	38,100	1,049	517,398	13	36,100	27	18,541	1	271	533	291,466	5

MATERIALS USED.

Aggregate cost.	Mixing sand.		Grinding sand.		Soda ash (carbonate of soda).		Salt cake (sulphate of soda).		Nitrate of soda.		Quicklime.		Limestone.		Arsenic.		
	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Bushels.	Cost.	Tons.	Cost.	Pounds.	Cost.	
$1,894,630	49,487	$137,694	227,416	$151,995	10,658	$378,901	6,006	$102,694	76	$3,605	2,526	$456	14,571	$39,976	470,936	$15,734	1
297,167	7,730	19,785	50,000	20,000	1,300	42,400	1,590	27,030	.....	.....	2,000	400	2,695	5,885	89,000	2,807	2
32,921	958	2,626	.....	.....	210	6,560	157	4,710	.....	.....	20	6	195	450	2,000	60	3
1,048,555	30,875	104,437	154,764	120,669	5,615	202,040	4,229	70,593	.....	.....	.....	.....	9,333	27,849	296,533	9,890	4
515,987	9,924	10,846	22,652	11,326	3,533	127,901	30	361	76	3,605	500	50	2,348	5,792	83,403	2,977	5

MATERIALS USED—continued.

Fire clay and pot clay.								Pots, not including those made at works.		Total cost of lumber, nails, straw, and hay.	Lumber, including that in boxes purchased.		Nails.		Straw and hay.		All other materials.	
Total.		American.		English.		German.												
Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Number.	Cost.		Number of M feet.	Cost.	Kegs.	Cost.	Tons.	Cost.	Cost.	
5,086,576	$62,577	4,903,364	$60,876	40,000	$492	143,212	$1,209	1,141	$37,300	$107,443	7,106	$87,976	3,621	$9,355	1,601	$10,112	$481,077	1
1,555,000	9,055	1,555,000	9,055	.....	.....	.....	.....	50	1,000	18,750	1,185	13,270	1,140	2,885	440	2,595	77,375	2
105,212	727	2,000	18	.....	.....	103,212	709	26	340	2,449	240	1,680	70	215	54	554	1,230	3
1,107,633	36,273	1,067,633	35,773	.....	.....	40,000	500	620	31,000	53,043	3,600	45,336	1,604	3,972	384	3,735	254,812	4
2,318,731	16,522	2,278,731	16,030	40,000	492	.....	.....	445	4,960	33,201	2,081	27,690	807	2,283	723	3,228	147,680	5

EQUIPMENT OF PLANT (NUMBER).

Furnaces.	Pots.	Casting tables.	Annealing ovens.	Smoothing machines.	Polishing machines.	Grinding machines.	Clay grinding mills.	Horses.	Mules.	Wagons.	Carts.	Drays.	Cost of new construction.	
49	725	62	542	28	214	123	16	44	23	26	27	7	$316,173	1
12	195	8	172	21	50	39	5	10	6	3	10	4	.....	2
6	22	6	21	.....	.....	.....	.....	3	.....	2	1	.....	.....	3
18	350	16	245	7	114	59	3	21	2	9	10	.....	225,173	4
13	158	32	104	.....	50	25	8	10	15	12	6	3	91,000	5

TABLE 4.—DETAILED STATEMENT,

	STATES.	Number of establishments reporting.	CAPITAL.							
				Value of plant.				Live assets.			
			Aggregate.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States....	84	$8,119,935	$5,523,854	$1,812,700	$2,819,932	$891,222	$2,596,081	$453,376	$1,232,340	$910,365
2	Indiana	8	723,100	503,500	77,500	253,000	173,000	219,600	52,300	103,900	63,400
3	New Jersey	12	967,923	597,000	111,500	365,000	120,500	370,923	50,732	106,921	213,270
4	Pennsylvania	24	3,753,207	2,702,250	1,290,000	1,029,500	382,750	1,050,957	220,725	412,516	417,716
5	All other states (a)	40	2,675,705	1,721,104	333,700	1,172,432	214,972	954,601	129,619	609,003	215,979

	STATES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.											
		Operatives and skilled.				Unskilled.				Piecework ers.			
		Males above 16 years.		Children.		Males above 16 years.		Children.		Males above 16 years.		Children.	
		Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States....	2,478	$1,514,928	75	$23,029	1,345	$686,615	17	$2,204	2,821	$2,659,794	107	$26,405
2	Indiana	268	124,530	.....	.....	78	25,250	.....	.....	427	384,971	.....	.....
3	New Jersey	219	130,279	.....	.....	318	103,619	15	1,580	511	483,206	19	1,500
4	Pennsylvania	662	390,240	75	23,020	599	252,373	2	624	1,189	1,190,457	82	23,917
5	All other states	1,329	869,879	.....	.....	350	305,373	.....	.....	694	601,160	6	988

	STATES.	MATERIALS USED—continued.									
		Arsenic.		Manganese.		Fuel.					
							Natural gas.	Coal.		Coke.	
		Pounds.	Cost.	Pounds.	Cost.	Total cost.	Cost.	Tons.	Cost.	Tons.	Cost.
1	The United States....	621,686	$22,457	21,500	$990	$684,550	$242,479	296,502	$397,542	2,742	$11,011
2	Indiana	24,500	1,672	.....	.....	18,388	200	14,515	18,188	.....	.....
3	New Jersey	11,724	403	.....	.....	119,741	.....	33,581	101,198	2,070	7,936
4	Pennsylvania	285,746	9,773	4,500	190	289,459	212,795	67,643	74,125	168	336
5	All other states	299,716	10,609	17,000	800	256,962	29,484	180,763	204,031	504	2,739

	STATES.	MATERIALS USED—continued.							
		Total cost of lumber, nails, straw, and hay.	Lumber, including that in boxes purchased.		Nails.		Straw and hay.		All other materials.
			Number of M feet.	Cost.	Kegs.	Cost.	Tons.	Cost.	Cost.
1	The United States..	$448,920	40,525	$280,468	8,566	$24,359	4,326	$34,093	$233,982
2	Indiana	50,507	4,868	46,293	604	1,624	395	2,590	8,246
3	New Jersey	44,601	5,135	36,967	1,549	4,008	512	3,626	15,386
4	Pennsylvania	201,308	18,318	178,974	1,741	5,344	2,084	16,990	165,162
5	All other states	152,504	12,204	128,234	4,672	13,383	1,335	10,887	45,188

a Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Delaware, 1; Illinois, 3; Maryland, 4; Massachusetts, 1; Michigan, 1; Missouri, 1; New York, 8; Ohio, 21. See description of Table 4 on page 316.

WINDOW GLASS, BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.								
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Aggregates.		Officers or firm members actively engaged in the industry or in supervision.		Clerks.				
									Males above 16 years.		Males above 16 years.		Females above 15 years.		
							Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
$559,307	$9,368	$51,227	$90,528	$90,765	$77,402	$239,927	7,513	$5,080,874	78	$95,747	86	$69,484	6	$2,677	D
122,527	.....	4,987	7,544	35,596	4,400	70,000	795	554,528	3	3,670	19	15,327	1	780	2
40,258	4,700	4,700	8,280	11,050	6,970	4,558	1,104	736,472	7	8,125	12	7,166	3	997	3
168,896	1,168	26,999	42,252	20,829	11,224	66,426	2,664	1,937,341	21	27,155	33	29,055	1	500	4
227,624	3,500	14,541	32,452	23,290	54,898	98,943	2,949	1,852,533	47	56,797	22	17,936	1	400	5

MATERIALS USED.														
Aggregate cost.	Mixing sand.		Soda ash (carbonate of soda).		Salt cake (sulphate of soda).		Salt (chloride of sodium).		Lime.		Quicklime.		Limestone.	
	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Bushels.	Cost.	Bushels.	Cost.	Tons.	Cost.
$2,726,905	108,305	$215,210	12,057	$339,197	29,618	$458,704	106	$353	10,563	$4,113	101,949	$13,921	24,341	$77,714	D
213,678	11,055	27,646	1,267	36,737	2,819	28,940	.....	.....	.....	.....	215	35	3,772	9,692	2
366,203	14,594	16,991	4,183	129,866	42	876	10	100	10,563	4,113	7,000	1,500	3,337	13,528	3
1,187,841	40,210	85,741	1,402	38,759	15,807	272,354	90	200	.....	.....	16,396	3,697	8,860	32,885	4
959,183	42,446	84,832	5,205	133,835	10,950	156,534	6	53	.....	.....	78,338	7,789	8,372	21,609	5

MATERIALS USED—continued.														
Fuel—Continued.				Fire clay and pot clay.								Pots, not including those made at works.		
Wood.		Petroleum.		Total.		American.		English.		German.				
Cords.	Cost.	Barrels.	Cost.	Pounds	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Number.	Cost.	
12,217	$31,268	1,125	$2,250	20,963,666	$177,560	12,431,073	$103,567	542,700	$4,335	7,989,888	$69,658	1,446	$50,134	F
.....	.....	.....	.....	1,363,000	16,930	453,000	6,700	.....	.....	910,000	10,230	397	14,885	2
2,671	8,357	1,125	2,250	1,057,500	14,653	518,500	6,300	.....	.....	539,000	8,353	159	4,445	3
921	2,203	.....	.....	8,479,932	76,271	6,342,232	58,120	4,700	70	2,133,000	18,081	292	12,042	4
8,625	20,708	.....	.....	10,063,234	69,706	5,117,346	32,447	538,000	4,265	4,407,888	32,994	508	18,762	5

PRODUCTS.				EQUIPMENT OF PLANT (NUMBER).										
Total value.	Window glass.		All other products.	Furnaces.	Pots.	Clay grinding mills.	Flattening ovens.	Monkey ovens.	Horses.	Mules.	Wagons.	Carts.	Drays.	Cost of new construction.	
	Boxes.	Value.	Value.												
$9,656,802	3,768,884	$9,037,187	$21,615	146	1,299	59	135	19	139	14	14	59	54	$54,373	D
885,745	360,114	885,745	.....	15	138	4	13	2	6	.....	1	3	.....	.....	2
1,316,170	622,432	1,295,100	21,070	24	188	9	22	1	27	.....	4	18	6	1,800	3
3,648,577	1,430,455	3,648,577	.....	43	400	19	45	9	56	14	8	13	20	50,773	4
3,298,310	1,355,883	3,207,765	545	64	573	27	55	7	50	.....	1	25	28	1,800	5

TABLE 5.—DETAILED STATEMENT,

	STATES.	Number of establishments reporting.	CAPITAL.							
			Aggregate.	Value of plant.				Live assets.			
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	125	$15,448,196	$8,203,164	$1,839,502	$3,838,739	$2,524,923	$7,245,032	$799,656	$2,856,889	$3,588,484
2	Illinois	4	783,138	384,190	80,802	214,164	89,224	398,948	96,249	96,647	206,052
3	Indiana	7	312,463	147,800	29,500	69,794	48,506	164,663	29,720	47,390	87,553
4	Maryland	5	371,205	212,008	35,000	127,419	49,589	159,197	28,051	121,146	10,000
5	New Jersey	4	866,099	407,425	21,500	215,000	170,925	458,674	68,183	176,333	214,158
6	New York	11	823,573	418,331	74,500	202,000	141,831	405,242	65,022	128,003	212,217
7	Ohio	30	2,487,144	1,391,102	191,322	773,998	425,782	1,096,042	104,574	463,103	528,365
8	Pennsylvania	53	8,432,043	4,542,218	1,292,245	1,888,364	1,361,609	3,889,825	322,889	1,579,388	1,987,548
9	West Virginia	7	825,313	377,757	33,000	213,000	131,757	447,556	36,319	144,652	266,585
10	All other states (a)	4	547,218	322,333	81,333	135,000	106,000	224,885	48,652	100,227	76,006

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.

	STATES.	Operatives and skilled.						Unskilled.					
		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.	
		Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States	7,580	$3,709,088	738	$141,268	2,376	$374,070	3,469	$1,124,727	707	$101,282	1,850	$230,249
2	Illinois	139	84,740	20	3,860	50	8,900	420	132,850	.....	.....	202	19,570
3	Indiana	250	71,679	21	1,600	75	9,644	32	9,180	.....	.....	23	2,253
4	Maryland	49	29,334	.....	.....	8	936	157	30,345	24	6,864	240	28,572
5	New Jersey	231	151,700	22	4,060	50	5,000	327	102,427	15	3,825	350	33,490
6	New York	804	498,347	52	9,800	134	22,627	261	94,940	10	2,080	178	30,234
7	Ohio	1,844	846,421	209	34,162	397	62,228	660	221,830	312	36,349	291	43,522
8	Pennsylvania	3,765	1,782,962	338	72,986	1,491	239,420	1,325	438,572	262	38,486	515	65,544
9	West Virginia	215	95,494	63	12,800	159	23,806	119	44,795	64	8,996	31	5,400
10	All other states	283	148,391	13	2,000	12	1,500	108	49,788	20	4,732	20	1,667

MATERIALS USED—continued.

	STATES.	Salt.		Pearlash.		Litharge (or red lead).		Lime.		Arsenic.		Manganese.	
		Tons.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Bushels.	Cost.	Pounds.	Cost.	Pounds.	Cost.
1	The United States	18	$100	2,544,978	$135,047	5,501,559	$300,096	366,037	$65,220	590,189	$19,226	436,304	$23,740
2	Illinois	.....	.....	.....	.....	40,000	2,400	10,525	2,340	59,176	1,853	13,926	848
3	Indiana	.....	.....	.....	.....	.....	.....	20,903	3,557	57,160	1,588	29,052	1,619
4	Maryland	.....	.....	77,000	3,550	94,000	4,975	17,675	1,009	14,020	395	14,000	765
5	New Jersey	.....	.....	34,035	1,877	39,873	2,118	19,750	4,027	15,906	492	15,585	735
6	New York	.....	.....	500,334	27,237	1,213,264	73,049	25,804	5,380	20,537	695	27,160	1,345
7	Ohio	.....	.....	335,216	16,985	786,991	35,810	71,890	12,688	167,756	5,500	106,281	5,785
8	Pennsylvania	18	100	1,474,093	77,440	3,086,681	167,499	155,643	29,328	159,897	5,898	209,810	11,464
9	West Virginia	.....	.....	50,000	3,500	100,000	5,800	14,107	3,237	89,822	2,606	16,450	985
10	All other states	.....	.....	74,300	4,458	140,750	8,445	29,650	3,654	5,915	199	3,450	194

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Georgia, 1; Kentucky, 1; Massachusetts, 2.

GLASSWARE, BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
							Aggregates.		Officers or firm members actively engaged in the industry or in supervision.		Clerks.			
									Males above 16 years.		Males above 16 years.		Females above 15 years.	
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
$865,115	$40,180	$69,526	$107,951	$153,836	$118,859	$374,763	23,313	$10,166,203	232	$361,419	346	$330,463	17	$4,765
47,279	.....	3,199	4,856	16,118	3,793	19,333	1,095	456,557	8	13,700	9	10,360	.....	.....
29,812	.....	1,075	3,551	10,456	4,330	9,800	603	324,312	12	18,350	5	7,150	1	312
15,966	.....	3,508	5,078	3,500	3,380	500	772	368,551	.....	.....	10	9,768	.....	.....
8,943	.....	3,593	1,563	1,475	2,312	.....	1,376	647,353	3	4,700	38	34,697	4	865
58,887	17,800	3,503	6,500	10,210	5,800	15,074	1,668	791,678	9	15,750	17	19,100	.....	.....
175,767	200	13,809	25,326	16,183	27,710	92,539	4,715	1,942,348	65	83,737	68	62,794	10	2,938
444,293	22,180	32,760	53,738	82,735	62,414	190,466	11,085	4,771,118	110	183,782	173	156,690	2	650
40,805	.....	4,301	4,536	8,950	1,650	21,368	1,405	558,025	18	20,900	16	17,046	.....	.....
43,363	.....	3,178	2,823	4,209	7,470	25,683	594	306,261	7	11,500	15	12,858	.....	.....

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—cont'd.						MATERIALS USED.								
Piecoworkers.							Mixing sand.		Soda ash (carbonate of soda).		Salt cake (sulphate of soda).		Nitrate of soda	
Males above 16 years.		Females above 15 years.		Children.		Aggregate cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.
Number.	Wages.	Number.	Wages.	Number.	Wages.									
2,568	$3,689,832	175	$42,750	315	$56,284	$4,925,234	115,746	$365,915	38,070	$1,274,382	200	$7,258	6,955	$274,686
247	182,577	.....	.....	.....	.....	256,067	7,248	11,277	2,668	86,294	.....	.....	579	18,330
184	204,147	.....	.....	.....	.....	187,706	5,996	15,004	2,333	85,270	165	6,281	263	10,190
242	257,326	.....	.....	42	5,406	139,971	6,721	20,133	927	25,170	.....	.....	230	8,371
341	306,583	.....	.....	.....	.....	189,364	4,720	17,966	1,826	54,133	.....	.....	263	11,189
130	85,920	10	2,080	63	10,800	337,499	3,995	20,385	1,239	44,677	.....	.....	232	10,797
827	540,851	12	2,516	20	5,000	982,667	24,867	74,107	8,977	282,817	.....	.....	1,628	59,021
2,855	1,733,737	90	27,321	159	30,986	2,446,746	55,200	180,958	17,831	615,915	20	750	3,277	138,658
636	306,060	63	10,830	21	2,892	277,033	5,350	20,845	2,209	77,725	.....	.....	410	15,140
106	72,625	.....	.....	10	1,200	108,181	1,649	5,240	60	2,381	15	221	67	2,990

MATERIALS USED—continued.														
Fuel.									Fire clay and pot clay.					
		Coal.		Coke.		Wood.		Petroleum.	Total.		American.		English.	
Total cost.	Natural gas.													
	Cost.	Tons.	Cost.	Tons.	Cost.	Cords.	Cost.	Barrels.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
$767,534	$415,358	145,975	$282,225	6,528	$19,435	3,844	$13,327	18,935	$37,189	5,769,637	$44,320	4,096,660	$29,829	255,333	$2,699
51,656	.....	20,118	26,196	500	2,250	.....	.....	11,716	23,300	134,000	710	134,000	710	.....	.....
178	.....	36	178	.....	.....	.....	.....	.....	.....	85,600	615	77,600	540	.....	.....
31,380	.....	12,756	26,974	1,110	3,142	398	1,244	.....	.....	420,000	3,200	220,000	1,800	.....	.....
60,244	.....	21,137	51,784	160	630	2,200	7,830	.....	.....	1,015,070	7,302	789,790	5,826	50,000	375
89,363	.....	25,626	78,318	1,996	6,935	342	1,446	1,332	2,664	379,510	3,390	204,010	2,033	2,000	20
80,322	61,323	24,759	16,550	750	450	216	424	787	1,575	973,810	8,657	900,410	7,623	.....	.....
271,493	303,035	32,850	61,004	1,412	3,633	413	1,571	1,100	1,650	1,887,283	13,805	1,125,350	7,878	203,333	2,304
54,685	51,000	3,160	2,085	500	1,800	.....	.....	.....	.....	662,550	3,245	595,000	2,745	.....	.....
28,033	.....	5,524	18,626	200	595	275	812	4,000	8,000	211,814	3,396	50,500	674	.....	.....

TABLE 3.—DETAILED STATEMENT,

	STATES.	MATERIALS USED—continued.													
		Fire clay and pot clay—Continued.		Pots, not including those made at works.		Total cost of lumber, nails, straw, hay, casks, and barrels.	Lumber, including that in boxes purchased.		Nails.		Straw and hay.		Casks and barrels.		All other materials.
		German.													
		Pounds.	Cost.	Number.	Cost.		Number of M feet.	Cost.	Kegs.	Cost.	Tons.	Cost.	Number.	Cost.	Cost.
1	The United States	1,417,644	$11,792	4,219	$255,535	$963,995	28,106	$353,518	10,093	$28,018	23,142	$177,426	1,647,397	$405,033	$428,180
2	Illinois			293	20,635	38,319	1,772	27,004	880	2,128	995	5,347	14,090	3,840	21,405
3	Indiana	8,000	75	154	10,370	48,445	2,425	38,870	320	2,695	932	5,880	3,000	1,000	4,589
4	Maryland	200,000	1,400	240	10,970	17,500	1,003	6,700	584	1,458	489	3,342	27,273	6,000	12,573
5	New Jersey	175,280	1,101	82	3,995	24,182	2,260	17,258	755	1,812	856	5,092	100	20	1,104
6	New York	173,500	1,337	135	5,290	42,479	731	6,936	370	1,013	955	7,830	119,429	26,700	13,312
7	Ohio	73,400	1,034	1,005	64,984	210,665	6,551	61,988	2,210	6,488	5,214	36,095	370,486	106,094	125,326
8	Pennsylvania	558,600	3,623	2,101	124,821	507,733	10,679	167,336	3,973	10,944	12,170	101,244	982,719	228,209	200,878
9	West Virginia	67,550	500	170	12,222	56,400	1,441	16,230	429	1,300	1,392	11,200	119,800	27,670	20,443
10	All other states	161,314	2,722	39	2,148	18,272	1,244	11,196	72	180	139	1,396	10,500	5,500	28,550

GLASSWARE, BY STATES: 1890—Continued.

Value of products.	EQUIPMENT OF PLANT (NUMBER).																Cost of new construction.	
	Furnaces.	Pots.	Glory holes.	Shops.	Annealing ovens.	Lears.	Grinding machines.	Clay grinding mills.	Presses or pressing machines.	Grinding and engraving machines.	Crimping machines.	Finishing machines.	Horses.	Mules.	Wagons.	Carts.	Drays.	
$18,601,244	238	2,312	694	2,136	484	539	16	39	801	798	233	91	181	5	27	61	67	$153,443	1
949,868	9	117	28	76	62	11	.....	2	2	1	.....	.....	8	.....	.....	3	2	6,478	2
672,179	13	74	31	60	17	23	.....	.....	8	4	.....	.....	2	.....	2	.....	.....	7,500	3
674,900	7	77	15	113	15	20	.....	1	4	17	15	50	5	.....	2	1	1	12,000	4
1,235,426	13	112	61	96	27	27	.....	4	17	47	.....	.....	25	.....	.....	3	18	24,000	5
1,307,156	21	198	23	165	17	41	3	7	30	23	.....	.....	25	2	.....	14	14	.....	6
3,554,370	46	475	120	387	29	138	7	8	243	258	57	21	18	.....	2	9	7	16,850	7
8,700,124	106	1,055	294	1,098	294	238	4	12	403	303	151	20	81	2	18	20	20	62,165	8
945,234	17	144	24	104	18	33	2	3	85	60	10	.....	12	.....	3	5	4	3,850	9
561,972	6	59	8	37	5	8	.....	2	9	85	.....	.....	5	1	.....	6	1	20,600	10

TABLE 6.—DETAILED STATEMENT, GREEN

	STATES.	Number of establishments reporting.	CAPITAL. Aggregate.	Value of plant. Total.	Land.	Buildings.	Machinery, tools, and implements.	Live assets. Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	69	$7,165,078	$3,507,539	$849,965	$1,931,350	$726,224	$3,657,539	$559,205	$1,425,306	$1,673,028
2	Illinois	4	570,840	318,581	45,698	221,170	51,713	252,259	85,538	33,375	133,346
3	Indiana	3	347,000	155,000	27,000	76,000	52,000	192,000	31,000	93,000	68,000
4	New Jersey	18	1,910,872	853,775	106,000	588,200	159,575	1,057,097	132,073	453,950	471,074
5	New York	20	684,318	292,669	97,000	135,000	60,669	391,649	42,436	113,038	236,175
6	Ohio	7	492,843	246,278	29,500	136,016	80,762	246,565	35,584	95,891	115,090
7	Pennsylvania	18	2,311,156	1,136,872	389,100	515,751	232,021	1,174,284	185,405	417,995	570,884
8	All other states (a)	9	848,049	504,364	155,667	259,213	89,484	343,685	47,169	218,057	78,459

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.

	STATES.	Operatives and skilled. Males above 16 years. Number.	Wages.	Females above 15 years. Number.	Wages.	Children. Number.	Wages.	Unskilled. Males above 16 years. Number.	Wages.	Females above 15 years. Number.	Wages.	Children. Number.	Wages.
1	The United States	1,800	$788,835	14	$1,351	700	$116,742	3,048	$845,256	112	$13,770	1,394	$159,175
2	Illinois	227	72,240	.....	.....	.....	.....	297	90,645	.....	.....	272	33,765
3	Indiana	79	22,634	9	351	68	5,862	397	93,333	100	12,000	.....	.....
4	New Jersey	583	241,752	.....	.....	110	17,123	986	293,726	3	360	501	57,204
5	New York	107	60,147	.....	.....	108	15,540	356	87,292	.....	.....	61	5,805
6	Ohio	95	36,350	.....	.....	46	4,462	168	54,516	5	1,200	90	11,780
7	Pennsylvania	553	258,227	5	1,000	312	69,984	485	122,051	4	210	263	25,581
8	All other states	156	97,485	.....	.....	62	9,771	359	103,693	.....	.....	207	25,040

MATERIALS USED—continued.

	STATES.	Lime. Bushels.	Cost.	Limestone. Tons.	Cost.	Arsenic. Pounds.	Cost.	Manganese. Pounds.	Cost.	Fuel. Total cost.	Natural gas. Cost.	Coal. Tons.	Cost.	Coke. Tons.	Cost.
1	The United States	448,637	$67,282	6,570	$18,760	140,196	$4,158	48,289	$2,005	$582,385	$36,766	162,970	$402,514	27,947	$28,471
2	Illinois	15,000	1,620	2,466	9,377	26,705	1,041	.....	.....	60,371	.....	34,663	40,297	8,733	19,346
3	Indiana	38,700	3,636	410	820	43,440	1,290	16,000	800	7,730	.....	4,864	6,080	280	1,400
4	New Jersey	160,772	23,345	60	120	47,026	1,084	1,500	50	204,966	.....	50,349	153,391	182	717
5	New York	40,168	11,180	293	587	190	11	2,329	170	62,287	.....	14,081	45,709	600	2,071
6	Ohio	33,150	4,020	566	1,480	11,650	272	4,900	122	15,845	3,256	8,806	11,422	40	130
7	Pennsylvania	96,635	13,416	2,055	5,626	4,217	219	2,600	278	111,534	33,510	22,209	63,112	.....	.....
8	All other states	64,211	10,065	720	750	6,368	241	20,960	585	119,652	.....	27,938	82,503	18,112	4,807

MATERIALS USED—continued.

	STATES.	Total cost of lumber, nails, straw, hay, casks, and barrels.	Lumber, including that in boxes purchased. Number of M feet.	Cost.	Nails. Kegs.	Cost.	Straw and hay. Tons.	Cost.	Casks and barrels. Number.	Cost.	All other materials. Cost.	Value of products.
1	The United States	$333,104	27,195	$248,975	7,982	$21,105	8,186	$53,310	43,674	$9,714	$146,264	$8,521,464
2	Illinois	18,793	961	15,323	772	1,809	340	1,661	.....	.....	45,833	995,907
3	Indiana	57,125	3,274	49,466	988	2,452	945	5,207	.....	.....	1,210	491,485
4	New Jersey	81,747	9,528	58,035	3,008	7,891	2,764	15,696	500	125	37,327	2,666,556
5	New York	42,126	2,880	31,080	516	1,628	772	5,168	20,886	4,320	10,570	603,686
6	Ohio	29,989	2,380	24,385	486	1,172	481	2,727	6,150	1,705	15,966	519,015
7	Pennsylvania	75,549	6,605	52,594	1,628	4,195	2,340	18,076	2,608	684	15,243	2,072,089
8	All other states	27,705	1,567	18,092	584	1,958	544	4,775	13,530	2,880	20,115	1,082,726

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 1; Colorado, 1; Georgia, 1; Kentucky, 1; Maryland, 2; Missouri, 2; Wisconsin, 1.

AND BLACK GLASS, BY STATES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.								
							Aggregates.		Officers or firm members actively engaged in the industry or in supervision.		Clerks.				
									Males above 16 years.		Males above 16 years.		Females above 15 years.		
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
$333,036	$20,717	$33,323	$50,003	$62,709	$83,287	$82,997	10,400	$4,454,304	70	$94,641	129	$100,275	9	$2,886	1
58,108	.....	1,502	4,817	11,202	1,184	39,403	1,224	521,168	6	12,300	5	3,850	.....	.....	2
33,445	.....	1,425	3,020	8,000	21,000	.....	904	260,603	2	800	5	2,943	2	750	3
66,808	1,950	10,233	11,259	14,675	17,064	11,627	3,360	1,478,894	22	28,341	63	46,184	5	1,544	4
30,479	13,600	4,171	3,554	2,100	5,709	1,345	882	315,656	5	8,000	12	8,958	2	592	5
20,665	.....	1,557	4,987	4,721	7,270	2,130	582	266,623	14	16,700	6	5,350	.....	.....	6
75,038	5,042	8,080	15,482	12,425	14,217	19,792	2,346	1,072,198	10	9,900	25	22,466	.....	.....	7
48,493	125	6,355	6,884	9,586	16,843	8,700	1,102	539,162	11	18,600	13	10,524	.....	.....	8

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.						MATERIALS USED.								
Piecework ers.							Mixing sand.		Soda ash (carbonate of soda).		Salt cake (sulphate of soda).		Salt (chloride of sodium).	
Males above 16 years.		Females above 15 years.		Children.		Aggregate cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.
Number.	Wages.	Number.	Wages.	Number.	Wages.									
3,026	$2,214,648	72	$11,225	20	$5,500	$2,594,216	95,790	$181,179	35,992	$1,115,753	2,268	$35,523	2,305	$12,451	1
417	308,368	.....	.....	.....	.....	310,838	12,130	18,980	4,391	140,314	46	389	598	3,032	2
192	113,930	50	8,000	.....	.....	166,823	7,040	17,700	2,708	69,487	120	2,040	10	60	3
1,085	792,500	2	160	.....	.....	755,386	29,964	42,783	10,635	314,813	1,500	22,500	80	768	4
211	126,257	20	3,065	.....	.....	244,681	8,001	17,714	3,266	93,326	113	1,450	104	430	5
158	136,265	.....	.....	.....	.....	156,984	6,108	12,517	2,133	65,016	169	2,888	127	661	6
669	563,279	.....	.....	20	5,500	611,850	22,951	53,713	9,439	307,625	195	2,823	541	5,021	7
294	274,049	.....	.....	.....	.....	347,654	9,593	17,772	3,420	125,172	125	3,433	845	2,479	8

MATERIALS USED—continued.													
Fuel—Continued.				Fire clay and pot clay.								Pots, not including those made at works.	
Wood.		Petroleum.		Total.		American.		English.		German.			
Cords.	Cost.	Barrels.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Number.	Value.
33,193	$90,884	18,600	$23,750	5,246,773	$44,446	1,922,755	$13,765	290,848	$4,125	3,033,170	$26,556	1,200	$50,906	1
329	728	.....	.....	176,000	1,275	176,000	1,275	.....	.....	.....	.....	105	9,813	2
100	250	.....	.....	150,000	1,125	150,000	1,125	.....	.....	.....	.....	100	3,800	3
13,346	50,858	.....	.....	1,768,720	17,599	560,000	2,674	240,000	3,482	968,720	11,443	277	8,284	4
18,334	14,507	.....	.....	638,163	4,145	100,315	981	50,848	643	487,000	2,521	15	615	5
400	1,037	.....	.....	266,440	2,020	244,440	1,900	.....	.....	22,000	120	147	6,188	6
4,748	14,912	.....	.....	1,611,450	13,222	396,000	3,710	.....	.....	1,215,450	9,512	210	7,581	7
1,936	8,592	18,600	23,750	636,000	5,060	296,000	2,100	.....	.....	340,000	2,960	346	14,625	8

EQUIPMENT OF PLANT (NUMBER).													
Furnaces.	Pots.	Glory holes.	Shops.	Annealing ovens.	Leers.	Grinding machines.	Clay grinding mills.	Horses.	Mules.	Wagons.	Carts.	Drays.	Cost of new construction.
131	597	276	758	1,116	60	47	39	178	6	21	62	59	$82,969
9	23	20	39	201	.....	4	1	16	.....	.....	3	4	20,610
8	42	1	17	28	20	4	.....	5	.....	.....	3	1	2,000
42	169	138	227	325	23	12	9	70	.....	8	26	24	17,959
18	61	18	71	87	6	4	8	22	.....	.....	9	9	250
9	46	10	54	93	4	6	2	3	.....	1	2	1	1,500
30	177	76	218	249	3	10	14	31	6	7	11	11	33,000
14	79	13	132	133	4	7	5	31	.....	5	8	9	7,650

TABLE 7.—CLASSIFICATION OF EMPLOYÉS AND WAGES, AND AVERAGE NUMBER OF EMPLOYÉS

	STATES.	Number of establishments reporting.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS													
			Aggregates.		Officers or firm members actively engaged in the industry or in supervision.			Clerks.						Operatives and skilled.		
					Males above 16 years.			Males above 16 years.			Females above 15 years.			Males above 16 years.		
			Average number.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.
1	The United States	294	45,987	$22,118,522	413	$40.70	$656,407	640	$22.33	$560,795	42	$8.54	$15,359	14,789	$12.88	$7,542,298
2	Illinois	13	2,793	1,232,761	17	42.79	30,500	14	25.82	14,210	.....	.....	.....	667	14.93	338,333
3	Indiana	21	3,089	1,544,831	25	37.81	36,820	42	19.68	32,860	12	10.30	6,002	851	11.21	382,943
4	Maryland	11	1,413	708,736	.....	.....	.....	16	19.25	12,176	.....	.....	.....	133	13.48	67,914
5	Massachusetts	6	514	219,427	3	61.22	6,500	15	21.07	11,274	.....	.....	.....	270	12.13	118,549
6	Missouri	5	1,152	596,236	15	63.91	38,150	23	19.02	15,661	1	10.01	271	543	11.79	304,557
7	New Jersey	34	5,840	2,862,719	32	31.77	41,166	108	19.82	88,047	12	7.02	3,406	1,033	12.38	523,731
8	New York	30	3,285	1,484,039	20	36.49	28,463	34	26.84	32,358	2	8.04	592	1,277	15.94	775,805
9	Ohio	59	6,654	3,131,578	116	33.25	144,921	89	24.12	82,064	11	7.66	3,338	2,584	14.25	1,351,932
10	Pennsylvania	99	18,934	9,247,160	155	46.40	275,337	267	22.96	241,553	4	8.97	1,750	7,098	12.11	3,494,822
11	West Virginia	7	1,405	558,025	18	39.66	29,900	16	24.82	17,046	.....	.....	.....	215	10.70	95,494
12	All other states (a)	9	911	533,007	14	40.06	24,650	16	20.01	13,548	.....	.....	.....	118	17.79	88,318

	STATES.	Average number of hours in ordinary day of labor.		WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (b)											
				Males above 16 years.											
		May to November.	November to May.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.
1	The United States	9.26	9.30	25,390	3,121	1,312	1,674	2,265	1,653	3,320	2,425	2,922	2,539	2,104	2,055
2	Illinois	9.31	9.65	1,578	360	13	119	32	236	162	113	222	51	144	156
3	Indiana	9.48	9.48	1,786	422	36	75	302	170	253	128	85	134	47	130
4	Maryland	9.32	9.45	570	266	7	4	63	51	49	59	19	27	13	12
5	Massachusetts	9.33	9.17	370	.....	45	47	27	23	19	21	50	79	53	6
6	Missouri	9.80	9.80	904	11	10	129	45	16	272	88	106	131	42	53
7	New Jersey	9.26	9.18	2,804	255	261	242	684	170	272	243	101	331	95	150
8	New York	9.00	9.32	2,224	143	49	195	181	151	252	227	261	286	245	234
9	Ohio	9.47	9.48	3,914	547	332	197	167	125	478	290	346	405	557	470
10	Pennsylvania	9.11	9.12	10,441	1,072	509	636	715	679	1,377	1,189	1,626	994	846	798
11	West Virginia	9.36	9.36	368	41	50	7	18	19	55	37	43	61	15	22
12	All other states	9.33	9.22	431	.....	.....	23	31	43	130	30	63	40	47	24

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 1; Colorado, 1; Delaware, 1; Georgia, 2; Kentucky, 2; Michigan, 1; Wisconsin, 1.

AT THE DIFFERENT WEEKLY RATES OF PAY, GLASS MANUFACTURE, BY STATES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Operatives and skilled—Continued						Unskilled.						Pieceworkers.		
Females above 15 years.			Children.			Males above 16 years.			Females above 15 years.			Children.				
Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.[1]	Total wages.	
32	$4.95	$157,352	3,223	$3.99	$525,640	9,548	$8.46	$3,122,430	824	$3.58	$115,712	3,275	$3.05	$393,106	12,431	$9,029,423	1
20	4.69	3,860	50	4.32	8,900	880	8.32	290,648				474	2.72	53,335	671	492,975	2
30	2.55	1,951	143	3.03	15,506	868	7.25	248,463	105	3.00	12,660	37	4.30	3,728	976	803,998	3
			8	3.00	936	421	5.06	77,988	24	6.95	6,864	278	2.93	32,433	533	510,425	4
13	4.90	2,000	12	3.98	1,500	82	8.85	24,792	6	6.66	1,732				113	53,080	5
			70	3.48	11,988	323	9.14	106,935				27	5.21	5,796	150	112,881	6
22	4.36	4,060	160	3.28	22,123	1,631	7.77	499,772	18	5.46	4,185	866	2.70	92,274	1,958	1,583,955	7
52	4.52	9,800	242	4.12	38,167	893	8.85	277,935	10	5.33	2,080	239	4.03	36,039	516	282,860	8
209	4.07	34,162	443	3.85	66,690	1,125	9.22	386,165	317	3.27	37,549	381	3.71	55,302	1,376	969,455	9
393	5.68	88,719	1,896	4.19	330,753	2,923	9.08	1,042,252	266	3.54	38,646	780	3.11	91,749	5,154	3,641,579	10
63	4.79	12,800	159	3.49	23,806	119	8.58	44,795	64	3.36	8,990	31	3.66	5,400	720	319,788	11
			40	3.31	5,271	283	9.90	122,685	14	4.60	3,000	162	2.38	17,050	264	258,487	12

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Females above 15 years.										Children.					
Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over.	
1,664	1,190	155	158	21	78	38	15	1	3	6,498	5,863	409	115	111	1
20	20									524	524				2
147	130		6	7			1		3	180	173		7		3
24			24							286	286				4
19	8	6	1	1						12	12				5
1							1			97	71	10	1	15	6
52	14	7	28	1		1		1		1,026	1,006	19	1		7
64	31	24	5	2		2				481	389	49		43	8
537	455	40	6		6	27	3			824	655	144	25		9
663	400	78	85	10	72	8	10			2,676	2,359	183	81	53	10
127	127									190	190				11
14	14									202	198	4			12

[1] In comparing the weekly rates of wages and number of employés at each rate with the average weekly earnings, it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés reported at the respective rates.

TABLE 8.—RANGE AND AVERAGE RATE OF DAILY WAGES, BY OCCUPATIONS: 1890.

[The employés are "males 16 years and over" unless otherwise stated.]

PLATE GLASS MANUFACTURE.

OCCUPATIONS.	Number of employés reported.	Range of daily wages.	Average daily wages.	OCCUPATIONS.	Number of employés reported.	Range of daily wages.	Average daily wages.
Blacksmiths	19	$2.00 to $3 50	$2.73	Laborers	127	$1.15 to $1.50	$1.39
Bricklayers	42	1.50 to 3.50	2.64	Machinists	134	2.25 to 3.46	2.33
Carpenters	82	1.00 to 3.33	2.16	Mill men	827	1.15 to 2.00	1.48
Crocus men	18	1.75 to 3.08	2.00	Mixers	93	1.15 to 2.00	1.50
Cutters	83	1.15 to 4.00	2.28	Plaster burners	16	1.50 to 3.00	1.68
Engineers	146	1.75 to 3.00	2.32	Polishers	402	1.74 to 2.75	2.45
Firemen	63	1.50 to 2.50	1.72	Pot makers	68	1.15 to 3.00	2.12
Founders	55	2.00 to 3.85	3.57	Roller men	222	1.15 to 3.00	1.87
Furnace builders	6	3.50 to 6.00	4.78	Sand quarrymen	28	1.30 to 1.63	1.42
Furnace men	155	1.20 to 3.00	2.12	Smoothers:			
Gas makers	52	1.75 to 2.33	1.94	Males 16 years and over	108	1.50 to 1.75	1.72
Glass packers	79	1.00 to 2.50	1.77	Females 15 years and over	47	1.00 to 1.10	1.05
Grinders	502	2.00 to 2.25	2.16	Teamsters	38	1.15 to 2.25	1.46
Kiln firemen	31	1.25 to 3.00	1.85	Teemers or pourers	60	1.35 to 3.50	2.55

WINDOW GLASS MANUFACTURE.

Batch wheelers	100	1.00 to 2.32	1.75	Layers-out:			
Blacksmiths	12	2.00 to 4.16	2.38	Males 16 years and over	108	1.33 to 2.73	1.82
Blowers	983	2.70 to 8.00	6.20	Males under 16 years	23	0.60 to 1.81	1.44
Boss blowers	100	3.33 to 11.50	6.84	Leer tenders	267	1.10 to 2.98	1.72
Boss cutters	58	2.50 to 7.50	5.82	Lime sifters	33	1.16 to 2.00	1.68
Carpenters	21	1.00 to 3.46	2.15	Managers	71	2.33 to 9.62	4.71
Clay trampers	154	1.00 to 2.50	1.37	Master teasers	110	1.66 to 6.66	3.78
Coal wheelers	44	1.16 to 2.32	1.54	Master teasers' helpers	152	1.33 to 2.50	1.92
Cutters	392	3.00 to 7.00	4.75	Mixers	132	1.12 to 2.50	1.89
Drivers	104	1.17 to 2.50	1.54	Pot makers	70	1.50 to 4.03	2.95
Engineers	7	1.25 to 2.50	1.59	Pot makers' assistants	6	1.25 to 1.66	1.55
Flatteners	242	2.00 to 10.00	5.38	Roller boys:			
Gatherers or tenders	976	2.88 to 5.03	3.94	Males 16 years and over	214	0.50 to 2.33	1.09
Glass packers	133	0.50 to 4.16	2.10	Males under 16 years	67	0.67 to 1.33	0.98
Laborers	593	1.00 to 1.75	1.31	Teasers	226	1.29 to 2.50	1.86
Layers-in	153	0.92 to 2.70	1.57				

GLASSWARE MANUFACTURE.

Blowers	2,488	2.00 to $8.00	4.58	Machinists	37	1.75 to 5.00	2.58
Carrying-in boys:				Managers	115	2.00 to 9.61	4.90
Males 16 years and over	901	0.43 to 1.10	0.72	Mixers	240	1.17 to 4.00	1.87
Males under 16 years	1,353	0.40 to 0.90	0.64	Mold holders:			
Clay trampers	47	1.00 to 2.00	1.50	Males 16 years and over	570	0.50 to 1.20	0.83
Cleaning-off boys:				Males under 16 years	552	0.45 to 1.10	0.70
Males 16 years and over	694	0.50 to 1.50	0.84	Mold makers	374	2.00 to 7.00	3.35
Males under 16 years	633	0.50 to 1.10	0.69	Packers:			
Cutters:				Males 16 years and over	623	1.00 to 3.50	2.03
Males 16 years and over	574	1.33 to 5.00	2.94	Females 15 years and over	27	0.67 to 1.33	0.96
Males under 16 years	22	0.75 to 1.50	0.88	Pot fillers	131	1.25 to 2.33	1.77
Females 15 years and over	75	0.62 to 1.25	1.02	Pot makers	32	1.30 to 3.66	2.71
Drivers	112	1.25 to 3.25	1.74	Pressers	594	2.50 to 5.00	3.89
Engravers:				Stickers-up:			
Males 16 years and over	245	2.50 to 5.00	3.04	Males 16 years and over	1,398	0.46 to 1.50	0.87
Females 15 years and over	33	1.25 to 1.50	1.34	Males under 16 years	795	0.40 to 1.10	0.72
Engineers	112	1.50 to 4.00	2.40	Teasers	158	1.18 to 3.00	2.21
Finishers	664	1.35 to 6.00	3.97				
Gatherers	1,600	1.00 to 3.20	2.29				
Laborers:							
Males 16 years and over	1,214	1.10 to 2.30	1.51				
Males under 16 years	73	0.55 to 0.83	0.73				
Females 15 years and over	509	0.50 to 1.50	0.85				
Females under 15 years	9	0.50 to 0.75	0.58				

GREEN AND BLACK GLASS MANUFACTURE.

Batch wheelers	49	1.00 to 2.29	1.51	Laying-up boys:			
Blacksmiths	9	1.60 to 3.33	2.27	Males 16 years and over	397	0.55 to 2.13	1.10
Boss blowers	61	2.50 to 7.00	5.27	Males under 16 years	74	0.50 to 1.50	0.82
Boss packers	67	1.28 to 3.33	2.02	Managers	67	1.73 to 9.00	4.22
Bottle blowers	1,139	2.50 to 6.50	4.73	Master teasers	82	1.65 to 5.00	3.10
Carboy blowers	5	6.00 to 10.00	8.40	Mixers	149	1.17 to 2.75	1.68
Carrying-in boys:							
Males 16 years and over	759	0.42 to 1.25	0.64	Other blowers	69	2.50 to 6.00	5.48
Males under 16 years	964	0.50 to 0.83	0.57	Packers	376	1.00 to 2.50	1.60
Clay trampers	50	1.00 to 2.00	1.40	Pot makers	24	1.25 to 5.00	2.80
Coal wheelers	60	1.00 to 2.00	1.51	Pot makers' assistants	30	1.00 to 2.00	1.44
Demijohn blowers	6	6.00 to 8.33	7.73	Stickers-up:			
Demijohn coverers	41	1.00 to 2.00	1.26	Males 16 years and over	425	0.50 to 1.50	0.72
Engineers	10	1.33 to 3.00	1.93	Males under 16 years	575	0.45 to 0.75	0.53
Fillers-in or helpers	125	1.17 to 2.50	1.73				
Finishers	208	1.50 to 5.50	4.48	Teamsters	20	1.25 to 3.00	1.70
Gatherers:				Teasers	127	1.18 to 3.00	1.77
Males 16 years and over	660	0.60 to 2.67	1.21	Vial blowers	441	2.50 to 6.00	4.72
Males under 16 years	52	0.66 to 1.25	1.02				
Grinders	56	0.60 to 5.00	1.74	Ware boys:			
Laborers	111	1.25 to 1.75	1.50	Males 16 years and over	141	0.67 to 3.00	1.56
Lime sifters	19	1.17 to 2.00	1.52	Males under 16 years	80	0.60 to 1.33	0.98

COKE.

COKE.

BY JOSEPH D. WEEKS.

The accompanying tables presenting the statistics of the manufacture of coke in the United States during the calendar year 1889 include only the figures relating to the production of coke from bituminous coal in ovens, pits, or mounds. The total output of the coke so produced was 10,008,169 short tons, valued at $16,494,454, as compared with a production in 1880 of 2,752,475 tons, valued at $5,359,489. Coke as a by-product of gas works or petroleum refineries is excluded from the tabular statement here given, being reported with the statistics of gas manufacture and petroleum refining, and to include the figures in this report would duplicate the results of census investigation. The quantity and value of coke produced as the residual product of the manufacture of gas and refined petroleum during the census year ending May 31, 1890, as shown by the reports made to this office, were as follows: gas works, 56,624,344 bushels, valued at $3,868,924, and in petroleum refining, 494,221 bushels, with a value of $56,997, a grand total for the two industries of 57,118,565 bushels, valued at $3,925,921, being equal in quantity to about one ninth and in value to nearly one-fourth of the production by ovens, pits, and mounds. The average value per ton of oven coke, as shown in the accompanying tables, was $1.65, and of coke produced by gas works and petroleum refineries was approximately $3.44 per ton. The difference in value of the two products is due to the fact that gas coke, being principally the product of gas works situated in the centers of manufacturing industries, has a ready market at the point of production, in addition to which it is sold to a considerable extent in a retail way for domestic consumption, and therefore commands a much higher price per ton.

The manufacture of coke is chiefly conducted in connection with the mining of coal, but in the treatment of the subject in this report it is regarded as an entirely separate and distinct industry from coal mining, and only those items of capital, labor, expense, and product which pertain strictly to coke manufacture are included in the tabular statements. Owing to the close connection between the two industries it has been difficult in many instances for manufacturers to separate their accounts so as to make an exact report of each operation.

SUMMARY OF STATISTICS.

The following comparative statement presents the statistics concerning the manufacture of oven coke as reported at the censuses of 1880 and 1890, with the percentage of increase in each item during the decade. This statement includes statistics for active establishments only.

COMPARATIVE SUMMARY, COKE MANUFACTURE: 1880 AND 1889.

ITEMS.	1880	1889	Percentage of increase.
Number of establishments reporting	126	218	73.02
Capital	$4,769,858	$17,462,729	266.11
Miscellaneous expenses (a)	.....	$394,784	.....
Average number of employés (aggregate)	3,140	9,159	191.69
Total wages	$1,197,744	$4,186,264	249.51
Officers, firm members, and clerks: (b)			
Average number	.....	161	.....
Total wages	.....	$113,632	.....
All other employés: (b)			
Average number	.....	8,998	.....
Total wages	.....	$4,072,632	.....
Cost of materials used	$2,995,441	$11,509,737	284.24
Value of products	$5,359,489	$16,498,345	207.83

a This item was not reported at the census of 1880. b Not reported separately at the census of 1880.

Previous census inquiries have not shown data relating to cost of manufacture other than the items of wages and materials. The census of 1890 was designed to embrace the entire cost of production, except interest on capital and depreciation of plant. The difference between the cost of production and the value of the product must not, therefore, be considered as the profit or earnings of the capital invested, and for the additional reason that the cost of selling and mercantile losses are not included. The census inquiry was intended only to ascertain the relation that capital, miscellaneous expenses, wages, cost of materials, and value of product bear to each other.

Owing to numerous consolidations of coke-making plants since 1880, and the fact that at the census of 1880 each bank of ovens was reported as a separate establishment, while at 1890 the entire plant is considered and counted as but one establishment, the number of establishments as given in the above table fails to exhibit the growth of the industry during the past decade. The number of active establishments has increased from 126 in 1880 to 218 in 1889, while the number of ovens, pits, or mounds has more than trebled, increasing in the 10 years from 9,738 to 32,659.

The following summary shows the number of ovens, pits, or mounds, and quantity and value of the coke produced; also the quantity of coal used and the yield of coal in coke as reported at the two census periods:

COMPARATIVE STATEMENT OF OVENS AND QUANTITY AND VALUE OF COKE, COKE MANUFACTURE: 1880 AND 1889.

ITEMS.	1880	1889
Ovens, pits, or mounds (active)	9,738	32,659
Coal used, short tons	4,360,110	15,795,087
Coke produced, short tons	2,752,475	10,008,169
Total value of coke at ovens	$5,359,489	$16,494,454
Average yield of coke per oven (tons)	283	306
Value of coke at ovens (per ton)	$1.95	$1.65
Yield of coal in coke (per cent)	63.13	63.36

The following statement presents the total capital and the different items of capital invested in both active and idle plants as reported at the Eleventh Census:

STATEMENT OF CAPITAL IN BOTH ACTIVE AND IDLE ESTABLISHMENTS, COKE MANUFACTURE: 1889.

ITEMS.	Active establishments.	Idle establishments.
Number of establishments reporting	218	28
Capital—aggregate	$17,462,729	$444,483
Land	1,405,342	6,425
Buildings	869,725	48,723
Ovens	10,817,624	312,661
Machinery, tools, and implements	823,790	44,791
Railway plant and water supply	2,063,803	24,983
Live capital	1,482,445	6,900

The proportion that the number of idle establishments and the amount of idle capital bear to the whole is inconsiderable, the number of idle establishments being but 11.38 per cent of the whole number, and the amount of idle capital being but 2.48 per cent of the whole amount of capital invested. The establishments that were idle were small and insignificant, showing an average capital of but $15,874 as compared with an average capital of $80,104 for the works in active operation.

The following is a statement for the United States, by states, of the number of idle establishments, with the amount of capital invested and the characteristics of the plant:

STATEMENT OF IDLE ESTABLISHMENTS, COKE MANUFACTURE, BY STATES: 1889.

STATES.	Number of establishments reporting.	Capital.	OVENS, PITS, OR MOUNDS (NUMBER).				Washers. (Number.)	Crushers. (Number.)
			Total.	Beehive ovens.	Belgian or flue ovens.	Other style ovens.		
The United States	28	$444,483	1,247	1,142	65	40	7	5
Alabama	1	19,000	76	76	.....	.....	.....	.....
Colorado	3	12,600	48	8	.....	40	.....	.....
Illinois	1	50,000	102	102	.....	.....	1	1
Indiana	1	1,800	9	9	.....	.....	.....	.....
Kansas	1	5,136	16	16	.....	.....	.....	.....
Kentucky	1	600	2	2	.....	.....	.....	.....
Pennsylvania	15	317,297	884	819	65	.....	6	4
Tennessee	2	16,050	58	58	.....	.....	.....	.....
West Virginia	3	22,000	52	52	.....	.....	.....	.....

OVENS.

The following is a classified statement of the number of ovens, pits, or mounds reported at the censuses of 1880 and 1890:

COMPARATIVE NUMBER OF OVENS, COKE MANUFACTURE, BY CLASSES: 1880 AND 1889.

CLASSIFICATION.	NUMBER OF OVENS, PITS, OR MOUNDS, BOTH ACTIVE AND IDLE.	
	1880	1889
Total	10,116	33,906
Beehive	9,728	33,271
Belgian or flue	316	298
Other styles	30	318
Pits or mounds	42	19

Notwithstanding the numerous experiments which have been made to save the waste products of combustion in the making of coke, very little progress has been made in this country during the past decade in the erection and operation of ovens designed for this purpose. But a comparatively small quantity of coke was made in 1889 in flue or retort ovens, or what is generally known as the belgian oven. The solid wall type of oven, usually the beehive form, continues to be almost exclusively used. The ovens classified in the above table under the heading of "Other styles" consist principally of modified forms of the beehive oven.

EMPLOYÉS AND WAGES.

The average number of employés directly engaged in the manufacture of coke in 1889, excluding officers, firm members, and clerks, was 8,998, receiving $4,072,632 in wages, as compared with 3,140 employés in 1880, receiving $1,197,744. In making comparisons of employés and wages at the two census periods, it should be considered that the schedule of inquiry used at the Eleventh Census provided for a more thorough exposition of the different classes of employés and the amount of wages. The classification of employés made at the Tenth Census was that of males 16 years and upward, females 15 years and upward, males under 16 years, and females under 15 years, with a further classification by occupations with the daily rates. The classification used at the Eleventh Census was as follows: first, operatives, engineers, and other skilled workmen, overseers and foremen, or superintendents (not general superintendents or managers); second, officers or firm members; third, clerks; fourth, watchmen, laborers, teamsters, and other unskilled workmen; fifth, pieceworkers (not included in the foregoing). A further division of the above classes into males, females, and children was required. The schedule used at the Eleventh Census has, without doubt, elicited a more complete return of officers, firm members, and clerks, and the total wages. The schedule used at the Tenth Census, in the matter of wages paid, asked only for the "total wages paid for all labor done at coke works".

The following statement shows the average number and total wages of employés reported at the census of 1890. classified as officers or firm members; clerks; skilled and unskilled, and pieceworkers:

STATEMENT OF EMPLOYÉS AND WAGES, COKE MANUFACTURE, BY CLASSES: 1889.

CLASSES OF EMPLOYÉS.	Average number.	Total wages.
Total	9,159	$4,186,264
Officers or firm members	37	33,297
Clerks	124	80,335
Skilled and unskilled	4,480	1,906,020
Pieceworkers	4,518	2,166,612

The weekly rates of wages paid and the average number of employés at each rate are given in the statement on the following page, which includes all classes of employés except pieceworkers.

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK, COKE MANUFACTURE: 1889.

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	4,608	1	32
Under $5	19	.....	29
$5 and over but under $6	13	.....	2
6 and over but under 7	345	.....	1
7 and over but under 8	1,072	.....	.....
8 and over but under 9	704	1	.....
9 and over but under 10	853	.....	.....
10 and over but under 12	289	.....	.....
12 and over but under 15	895	.....	.....
15 and over but under 20	316	.....	.....
20 and over but under 25	26	.....	.....
25 and over	76	.....	.....

The average number of employés and average weekly earnings per employé for each class of employés, not including pieceworkers, are shown in the following table, by states and territories:

AVERAGE WEEKLY EARNINGS PER EMPLOYÉ OF EACH CLASS, COKE MANUFACTURE, BY STATES AND TERRITORIES: 1889.

STATES AND TERRITORIES.	OFFICERS OR FIRM MEMBERS.		CLERKS.				OPERATIVES, SKILLED AND UNSKILLED.			
	Males above 16 years.		Males above 16 years.		Females above 15 years.		Males above 16 years.		Children.	
	Average number.	Average weekly earnings per employé.	Average number.	Average weekly earnings per employé.	Average number.	Average weekly earnings per employé.	Average number.	Average weekly earnings per employé.	Average number.	Average weekly earnings per employé.
The United States	37	$21.24	123	$14.96	1	$8.93	4,448	$10.15	32	$3.64
Alabama	3	29.49	5	12.17	.....	.....	376	8.00	15	3.96
Colorado	1	25.76	5	15.20	.....	.....	138	12.29	.....	.....
Indiana	.....	.....	.....	.....	.....	.....	18	7.44	.....	.....
Kansas	.....	.....	.....	.....	.....	.....	18	9.96	.....	.....
Kentucky	1	11.54	1	7.69	.....	.....	15	10.73	.....	.....
Missouri	.....	.....	.....	.....	.....	.....	5	9.98	.....	.....
Ohio	.....	.....	3	10.67	.....	.....	94	9.03	.....	.....
Pennsylvania	15	20.59	83	15.81	1	8.93	2,825	10.99	3	3.80
Tennessee	.....	.....	.....	.....	.....	.....	163	7.71	7	2.89
West Virginia	17	21.05	23	12.73	.....	.....	659	7.91	7	3.92
All other states and territories (a)	.....	.....	3	16.55	.....	.....	137	9.73	.....	.....

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Georgia, 1; Illinois, 2; Indian territory, 1; Montana, 2; Utah, 1; Virginia, 2; Washington, 1; Wisconsin, 1.

Of the entire number of establishments 168 report as to periods elapsing between wage payments, 94 reporting monthly payments, 66 fortnightly, and 8 weekly. Of the 147 establishments in 1880, 1 reported quarterly payments, 86 monthly, 3 every three weeks, 14 fortnightly, and 6 weekly.

The returns at the census of 1890 show that the system of company stores in connection with the work is followed by 83 operators; 87 report that they do not conduct such stores, while 48 establishments make no report under this head. In 1880 returns in regard to the method of wage payments were received from 118 establishments, 56 reporting the operation of stores, and 62 making payments in cash.

MATERIALS USED.

Coal is the principal item of expense in the manufacture of coke, and is the only material entering into the product. The quantity and value of coal consumed in coke making at the two censuses are given in the following table, by states and territories:

COMPARATIVE STATEMENT OF QUANTITY AND COST OF COAL USED, COKE MANUFACTURE, BY STATES AND TERRITORIES: 1880 AND 1889.

STATES AND TERRITORIES.	COAL CONSUMED (SHORT TONS).			
	1880		1889	
	Tons.	Cost.	Tons.	Cost.
The United States	4,360,110	$2,761,657	15,795,087	$11,110,700
Alabama	67,376	75,314	1,789,047	1,755,876
Colorado	29,500	29,500	323,731	399,778
Indiana	1,500	2,025	16,428	16,156
Kansas			21,600	9,011
Kentucky			25,192	13,542
Missouri			8,485	3,118
Ohio	193,848	228,432	134,178	123,992
Pennsylvania	3,608,095	2,031,305	11,336,985	6,992,573
Tennessee	179,311	124,137	619,016	523,400
West Virginia	148,480	135,944	1,025,885	686,570
All other states and territories (a)	132,000	135,000	494,540	586,684

a Includes establishments in the following states, grouped in order to avoid disclosing individual establishments: for 1889, Georgia, Illinois, Indian territory, Montana, Utah, Virginia, Washington, and Wisconsin; for 1880, Georgia and Illinois.

The coal consumed in the manufacture of coke is classified under four divisions, viz, run of mine or lump, unwashed; run of mine or lump, washed; slack, unwashed; and slack, washed. Where coal is mined exclusively for coke making, the run of the mine or lump, unwashed, is principally used. The quantity and cost of the coal used, classified as above mentioned, is given in the following statement:

STATEMENT OF QUANTITY AND COST OF DIFFERENT CLASSES OF COAL USED, COKE MANUFACTURE: 1889.

CLASSES OF COAL.	Tons.	Cost.
Total	15,795,087	$11,110,700
Run of mine or lump, unwashed	11,631,436	8,255,542
Run of mine or lump, washed	421,074	305,983
Slack, unwashed	3,195,322	2,333,597
Slack, washed	547,255	215,578

Of the total quantity of coal used, the run of mine or lump, unwashed, contributed 73.64 per cent; the run of mine or lump, washed, 2.67 per cent; slack, unwashed, 20.23 per cent, and slack, washed, 3.46 per cent.

The average cost of each of the various grades of coal was as follows: run of mine or lump, unwashed, 71 cents per ton; washed, 73 cents; slack, unwashed, 73 cents; washed, 39 cents. The cost of slack coal, unwashed, is considerably increased to the coke manufacturer in many cases by reason of the handling and freight charges necessary to bring it to the point of consumption. In the case of washed slack, it is evident that the slack, unwashed, was regarded as of little value.

The schedule of inquiry used in collecting the statistics of coke manufacture contained separate questions as to the quantity and cost of fire brick, red brick, castings, and wood, but in most establishments the accounts were not kept so as to enable separate answers to be made, and all such materials are included in the tabular statements under the head of "All other materials" with sundry other materials used at the ovens.

The statement on the following page gives the relative rank of the states and territories in the production of coke, with the number of tons produced and the percentage that the total in each state is of the total for the United States at the censuses of 1880 and 1890.

COMPARATIVE STATEMENT OF PRODUCTION AND RANK OF EACH STATE AND TERRITORY, COKE MANUFACTURE: 1880 AND 1889.

STATES AND TERRITORIES.	RANK.		TONS OF COKE.		PERCENTAGE OF TOTAL OUTPUT.		STATES AND TERRITORIES.	RANK.		TONS OF COKE.		PERCENTAGE OF TOTAL OUTPUT.	
	1880	1889	1880	1889	1880	1889		1880	1889	1880	1889	1880	1889
United States			2,752,475	10,008,169	100.00	100.00	Montana		10		(a)		
Pennsylvania	1	1	2,317,149	7,372,653	84.18	73.67	Kansas		11		13,910		0.14
Alabama	6	2	42,035	1,055,823	1.53	10.55	Kentucky		12		13,021		0.13
West Virginia	3	3	95,720	612,645	3.48	6.12	Illinois	8	13	7,600	(a)	0.28	
Tennessee	4	4	91,675	356,964	3.33	3.57	Indiana	9	14	1,000	8,301	0.04	0.08
Colorado	7	5	18,000	199,638	0.65	1.99	Indian territory		15		(a)		
Virginia		6		(a)			Missouri		16		5,275		0.05
Georgia	5	7	70,000	(a)	2.54		Washington		17		(a)		
Ohio	2	8	109,296	75,826	3.97	0.76	Utah		18		(a)		
Wisconsin		9		(a)			All other states and territories. (a)				294,113		2.94

a Includes establishments in the following states, grouped in order to avoid disclosing individual establishments: for 1889, Georgia, Illinois, Indian territory Montana, Utah, Virginia, Washington, and Wisconsin.

The statistics as exhibited in the above statement show an increase in states that in 1880 were established seats of coke manufacture, and moreover in certain states where it had no existence in 1880, notably Kansas, Kentucky, and Missouri.

Pennsylvania still maintains its rank as the leading coke manufacturing state. While its percentage of the total product for 1880 was 84.18 and for 1889 is 73.67, showing a relative decrease, the actual increase in the number of tons is 5,055,504, more than one-half of the entire production for 1889, and the percentage of increase for the state is 218.18.

Alabama has advanced from sixth place in 1880 to second in 1889. Its percentage of the total production for 1880 was 1.53 and for 1889 is 10.55. The actual increase is 1,013,788 tons. During the census year the blast furnaces of Alabama consumed 1,172,471 tons of coke, exceeding the production of the state by 116,648 tons.

West Virginia is in 1889 as it was in 1880, the third coke producing state. It produced, in 1880, 3.48 per cent of the entire supply, and in 1889, 6.12 per cent, while the actual increase is 516,925 tons.

Tennessee occupies the fourth place in coke production, as it did in 1880. Its product in 1880 was 3.33 per cent of the whole, and in 1890, 3.57 per cent, being an increase of 265,289 tons.

With the single exception of Ohio, the industry has increased in all the coke manufacturing states. During the decade Ohio has fallen from second to eighth place, its production undergoing an actual decrease of 33,470 tons. The coal found in Ohio is generally unsuitable for the manufacture of a superior grade of coke, and the nearness of the Connellsville (Pennsylvania) and the West Virginia coal fields has led the large establishments to draw their supply from these sources.

Returns were received from two establishments in New Mexico, but they are so incomplete as to be useless for census purposes.

RELATIVE PRODUCTIVE RANK OF COKE DISTRICTS.

In the statement on the following page the 13 principal coke districts or regions are arranged in the order of their importance as producing centers, the number of establishments and production for each district is given, also the percentage that the quantity of coke produced in each district is of the total production for the United States. These 13 districts produced 9,298,614 tons of coke during the census year, or 92.91 per cent of the output of the entire country, the Connellsville district, Pennsylvania, alone producing 56.16 per cent of the entire quantity and 76.23 per cent of the total for that state.

STATEMENT OF QUANTITY AND VALUE OF PRODUCTS, COKE MANUFACTURE, BY DISTRICTS: 1889.

DISTRICTS.	Rank.	Number of establishments reporting.	Number of tons of coke.	Value of products.	Percentage of total quantity.
The United States		218	10,008,169	$16,498,345	100.00
Connellsville, Pennsylvania	1	32	5,620,458	7,533,522	56.16
Warrior, Alabama	2	15	964,524	2,249,604	9.64
Upper Connellsville, Pennsylvania	3	12	417,262	609,828	4.17
Tennessee, (a) Tennessee	4	8	356,964	726,004	3.57
Allegheny Mountain and Somerset, Pennsylvania	5	15	354,288	b601,963	3.54
Flat Top, West Virginia and Virginia	6	14	321,687	542,218	3.21
Reynoldsville and Walston, Pennsylvania	7	5	312,822	436,591	3.12
Pittsburg, Pennsylvania	8	13	224,856	c482,984	2.25
New River, West Virginia	9	11	185,044	399,294	1.85
Irwin, Pennsylvania	10	5	183,977	250,747	1.84
El Moro, Colorado	11	4	130,387	398,159	1.30
Clearfield and Center, Pennsylvania	12	6	120,734	215,112	1.21
Northern, West Virginia	13	14	105,611	179,601	1.05
Total for 13 districts		154	9,298,614	14,625,627	92.91
All other districts		64	709,555	d1,872,718	7.09

a Includes the entire state.
b Includes other products valued at $125.
c Includes other products valued at $3,352.
d Includes other products valued at $414.

RELATION OF PRODUCT TO COST.

The following is a comparative statement of the total quantity and cost of coal used in the manufacture of coke, the quantity and value of coke produced, and the quantity and cost of coal per ton of coke in 1880 and 1889:

COMPARATIVE STATEMENT OF QUANTITY AND COST OF COAL USED IN THE MANUFACTURE OF COKE: 1880 AND 1889.

ITEMS.	1880	1889
Total coal used (tons)	4,360,110	15,795,087
Total cost of coal	$2,761,657	$11,110,700
Average cost of coal per ton	$0.63	$0.70
Tons of coke made	2,752,475	10,008,169
Value of coke made	$5,359,489	$16,494,454
Average value of coke per ton	$1.95	$1.65
Quantity of coal per ton of coke (pounds)	3,168	3,156
Average cost of coal to ton of coke	$1.00	$1.11

The average cost of wages to the ton of coke was 42 cents in 1889 and 44 cents in 1880, and the average cost per ton of coke of fire brick for repairs, red brick, and all other similar materials in 1889 was 4 cents, and in 1880 8 cents.

An examination of the relation between the number of employés and the output of coke shows that the methods of handling coke have been much improved during the past decade, the number of employés in 1880 being to the number of tons of coke manufactured as 1 to 877, and in 1889 as 1 to 1,093. This difference in relation may be materially changed by a difference in the time the industry was in operation during the two periods, but as there are no data included in the figures for 1880 from which such average time can be ascertained, it is not possible to say to what extent this relative difference would be affected.

The following statement shows the cost of wages and materials in manufacturing a product valued at $100; also the amount of capital shown for the same, as compiled from the reports at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT OF CAPITAL, WAGES, AND MATERIALS IN PRODUCT VALUED AT $100, COKE MANUFACTURE: 1880 AND 1889.

YEARS.	Capital.	Wages.	Materials.
1880	$89.00	$22.35	$55.89
1889	105.85	25.37	69.76

The following statement presents the percentage of yield of coal in coke for the United States and for each state in which three or more establishments were in operation during the year 1889:

STATEMENT OF QUANTITY AND PERCENTAGE OF YIELD OF COAL IN COKE: 1889.

STATES AND TERRITORIES.	Number of tons of coal used.	Number of tons of coke manufactured.	Percentage of yield in coke.
The United States	15,795,087	10,008,169	63.36
Alabama	1,789,047	1,055,823	59.02
Colorado	325,731	199,638	61.67
Indiana	16,428	8,301	50.53
Kansas	21,600	13,910	64.40
Kentucky	25,192	13,021	51.69
Missouri	8,485	5,275	62.17
Ohio	134,178	75,826	56.51
Pennsylvania	11,336,985	7,372,653	65.03
Tennessee	619,016	356,964	57.67
West Virginia	1,025,885	612,645	59.72
All other states and territories (a)	494,510	294,113	59.47

a Includes establishments in the following states and territories, grouped in order to avoid disclosing individual establishments: Georgia, Illinois, Indian territory, Montana, Utah, Virginia, Washington, and Wisconsin.

In 1880 there were consumed 4,360,110 tons of coal in the production of 2,752,475 tons of coke, or an average yield of coke per ton of coal of 63.13 per cent. The small increase in the yield during the decade is due to the great growth of coke manufacture in the southern states, where the output of coke to the ton of coal used is below that achieved at works in Pennsylvania. These reports of yield, however, must be received with some reservation. At many works the coal charged is not weighed. At some the measured bushel or ton is used which may or may not be the same number of pounds as the weighed bushel or ton. In cases where slack is used, often the coal is not weighed at all, but only estimated. The greater care that is being taken in the preparation of the coal, the use of better ovens, and the introduction of more economical methods of working, it is believed, will lead to an increased yield of coal in coke in the future.

Special inquiries were made at the census of 1890 to determine the miscellaneous expenses incurred in manufacturing other than the expenditures for materials and labor, but the conditions under which the business of coke making is conducted at different plants rendered it difficult, and in many instances impossible, to secure from each producer accurate data in regard to these items. The following statement presents the totals obtained in answer to these questions, with the number of establishments reporting each item:

STATEMENT OF MISCELLANEOUS EXPENSES AS REPORTED AT THE CENSUS OF 1890, COKE MANUFACTURE.

ITEMS.	Number of reports.	Amount.
Total		$394,784
Rent of tenancy	13	10,716
Taxes	112	78,284
Insurance	45	10,633
Repairs, ordinary, of buildings and machinery	69	54,144
Amount paid to contractors	4	59,501
Interest paid on cash used in the business	22	39,204
All sundries (not reported in any of the foregoing items)	46	142,302

CONSUMPTION OF COKE BY BLAST FURNACES.

The principal consumption of coke is in the manufacture of pig iron, the blast furnaces of the country consuming, during the census year 1890, 9,237,935 short tons of coke.

The following is a statement of the quantity of coke consumed by blast furnaces in 1880 and 1890, with the percentage that the quantity so consumed is of the total production:

COMPARATIVE STATEMENT OF QUANTITY OF COKE CONSUMED IN BLAST FURNACES: 1880 AND 1890.

YEARS.	Total quantity of coke manufactured. (Tons.)	COKE USED BY BLAST FURNACES.	
		Tons.	Percentage of total quantity.
1880	2,752,475	2,128,255	77 32
1890	10,008,169	9,237,935	92.30

As a further evidence of the increased use of coke by blast furnaces between 1880 and 1890, it appears that the total cost of fuel consumed by the blast furnaces of the country, as reported in the census of 1880, was $21,917,002, of which $8,129,240 was paid for coke, or 37.09 per cent of the total. The total cost of fuel used by blast furnaces in 1890 was $37,884,383, of which $27,435,780 was paid for coke, being 72.42 per cent of the whole amount. Of the 3,345,703 tons of pig iron produced in 1880 by the aid of mineral fuel, 1,517,553 tons, or 45.36 per cent, were produced with coke, or in some instances with a mixture of bituminous coal and coke; and in 1890, of the 9,241,896 tons of pig iron manufactured with mineral fuel, 7,017,769 tons, or 75.93 per cent, were manufactured with coke, or in some instances with a mixture of bituminous coal and coke. Coke is also extensively used in eastern Pennsylvania, New York, and New Jersey as a mixture with anthracite coal in pig iron manufacture.

TABULAR STATEMENTS.

The statistical tables accompanying this report are as follows:

Table 1 is a comparative statement by state totals, showing the items of the inquiry common to both censuses.

Table 2 is a detailed statement of the data concerning the manufacture of coke as reported at the Eleventh Census. It shows the various subdivisions of capital, miscellaneous expenses, employés and wages, materials used, and products; also the characteristics of plant.

Table 3 is a presentation of the statistics of employés and wages. It shows the employés classified as (1) officers or firm members; (2) clerks; (3) operatives, including skilled and unskilled, and their further division by males, females, and children, with the total wages for each class, and the average weekly earnings per employé; (4) pieceworkers. It also shows the weekly rates of wages paid and the average number of employés, males, females, and children, at each rate.

The largest number of employés at coke plants would be classed as common labor, the character of the work requiring strength and physical endurance more than skilled manipulation on the part of most workmen. The returns from the manufacturers in regard to the separation of the employés into skilled and unskilled showed such varying opinions as to what constituted each class that it has been considered impracticable to show skilled and unskilled employés separately.

The schedule of inquiry called for the "average number employed during the year", that is, the average number having continuous employment for the full time reported by individual establishments. Upon this basis the computations are made to obtain "the average weekly earnings". The average number of employés reported for each establishment is multiplied by the number of weeks the establishment was in operation; the result is the number of weeks required for 1 employé to perform the labor. Aggregating such results of individual reports, the number of weeks required for 1 employé to perform the entire labor is obtained. This number, used as a divisor for the total wages reported, produces the true average weekly earnings.

The ton reported in the appended tables is the short ton of 2,000 pounds.

TABLE 1.—DETAILED COMPARATIVE STATEMENT, COKE

	STATES AND TERRITORIES.	Year.	Number of establishments reporting. (a)	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. Aggregates. Average number.	Total wages	Males above 16 years.	Females above 15 years.	Children.	MATERIALS USED. Aggregate cost.	Coal. Total. Tons.	Cost.	Washed and unwashed. Run of mine or lump. Tons	Cost.
1	The United States	1880	126	$4,769,858	3,140	$1,197,744	3,066	3	71	$2,995,441	4,360,110	$2,761,657	3,729,328	$2,392,449
		1889	218	17,462,729	9,159	4,186,264	9,102	1	56	11,509,737	15,795,687	11,110,700	12,052,510	8,561,525
2	Alabama	1880	3	106,500	64	38,500	64			76,618	67,376	75,314	66,376	73,814
		1889	19	1,368,238	1,128	436,948	1,093		35	1,810,274	1,789,047	1,755,876	1,348,104	1,324,386
3	Colorado	1880	1	150,000	75	13,500	75			30,100	29,500	29,500	29,500	22,600
		1889	7	594,393	253	166,735	253			408,183	323,731	394,778	41,680	64,270
4	Indiana	1880	1	8,000	4	300	4			2,225	1,500	2,025	1,500	2,025
		1889	3	48,930	22	8,164	22			20,133	16,428	16,156	5,928	13,260
5	Kansas	1880	(c)											
		1889	6	17,060	19	5,845	19			9,099	21,600	9,012		
6	Kentucky	1880	(c)											
		1889	5	80,670	28	11,279	28			14,155	25,192	13,542	2,942	2,830
7	Missouri	1880	(c)											
		1889	3	5,275	5	1,881	5			3,557	8,485	3,118		
8	Ohio	1880	15	144,012	153	51,977	150		3	233,831	193,848	228,432	148,292	181,112
		1889	13	120,215	143	65,388	143			125,565	134,178	123,992	85,514	82,967
9	Pennsylvania	1880	89	3,759,325	2,444	983,431	2,379	3	62	2,241,154	3,608,095	2,031,305	3,144,969	1,786,717
		1889	98	12,000,820	5,954	2,976,692	5,950	1	3	7,280,566	11,336,985	6,992,573	9,750,174	6,185,835
10	Tennessee	1880	4	200,021	114	38,820	114			132,229	179,311	124,137	80,911	75,137
		1889	8	541,350	256	93,385	245		11	532,493	619,016	523,400	264,462	263,815
11	West Virginia	1880	11	292,000	163	48,942	159		4	138,964	148,480	135,944	140,780	131,044
		1889	45	1,716,837	1,074	310,268	1,067		7	709,576	1,025,885	686,576	386,584	294,357
12	All other states and territories.	d1880	2	110,000	123	22,274	121		2	140,320	132,000	135,000	117,000	120,000
		e1889	11	768,041	277	109,679	277			596,136	494,540	586,684	167,122	329,805

a In 1889 concerns having more than one plant were counted as one establishment, but in 1880 each plant was counted as an establishment.
b The quantity and cost of coal under this head, with the exception of the added cost of washing in 1880, is included under the head "Coal, washed and unwashed".

MANUFACTURE, BY STATES AND TERRITORIES: 1880 AND 1889.

MATERIALS USED—continued.					PRODUCTS.				OVENS, PITS, OR MOUNDS (NUMBER).					
Coal—Continued.														
Washed and unwashed—Continued.		Washed. (b)		All other materials.	Total value.	Coke.		All other products.	Total.	Beehive ovens.	Belgian or flue ovens.	Other style ovens.	Pits or mounds.	
Slack.		Run of mine or lump and slack.												
Tons.	Cost.	Tons.	Cost.	Cost.		Tons.	Value.	Value						
630,782	$358,558	751,824	$533,818	$233,784	$5,359,489	2,752,475	$5,359,489	.....	9,738	9,424	242	30	42	1
3,742,577	2,549,175	968,329	521,561	399,037	16,498,345	10,008,169	16,494,454	$3,891	32,659	32,129	233	278	19	
1,000	1,500	.....	.....	1,304	148,026	42,035	148,026	.....	216	216	.....	.....	.....	2
440,943	431,490	9,000	4,500	54,398	2,474,377	1,055,823	2,474,377	.....	3,693	3,459	160	74	.....	
.....	.....	29,500	29,500	600	90,000	18,000	90,000	.....	128	128	.....	.....	.....	3
282,051	335,508	.....	.....	8,405	673,479	199,638	673,479	.....	872	672	.....	200	.....	
.....	.....	.....	.....	200	3,000	1,000	3,000	.....	20	20	.....	.....	.....	4
10,500	2,896	10,500	2,896	3,977	25,922	8,301	25,922	.....	102	102	.....	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
21,600	9,011	.....	.....	88	26,593	13,910	26,593	.....	52	52	.....	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
22,250	10,712	15,930	3,982	613	29,769	13,021	29,769	.....	164	164	.....	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7
8,485	3,118	.....	.....	439	5,800	5,275	5,800	.....	9	9	.....	.....	.....	
45,556	47,320	.....	.....	5,399	334,546	109,296	334,546	.....	619	619	.....	.....	.....	8
48,664	41,025	6,608	1,652	1,573	219,560	75,826	219,560	.....	462	462	.....	.....	.....	
463,126	244,588	596,713	426,581	209,849	4,190,136	2,317,149	4,190,136	.....	7,589	7,305	242	.....	42	9
1,586,811	806,738	801,810	392,811	287,993	10,415,628	7,372,653	10,412,101	3,527	21,405	21,338	48	.....	19	
98,400	49,000	110,611	62,737	8,092	212,493	91,675	212,493	.....	589	589	.....	.....	.....	10
354,554	259,585	5,035	5,035	9,093	726,004	356,964	726,004	.....	1,581	1,577	.....	4	.....	
7,700	4,900	.....	.....	3,020	216,588	95,720	216,588	.....	407	407	.....	.....	.....	11
639,301	392,213	81,769	37,166	23,006	1,130,762	612,645	1,130,398	364	3,140	3,140	.....	.....	.....	
15,000	11,250	15,000	15,000	5,320	164,700	77,600	164,700	.....	170	140	.....	30	.....	12
327,418	256,879	37,677	73,519	9,452	770,451	294,113	770,451	.....	1,179	1,154	25	.....	.....	

c None reported in 1880.
d Embraces establishments distributed as follows: Georgia, 1; Illinois, 1.
e Embraces establishments distributed as follows: Georgia, 1; Illinois, 2; Indian territory, 1; Montana, 2; Utah, 1; Virginia, 2; Washington, 1; Wisconsin, 1.

TABLE 2.—DETAILED STATEMENT, COKE

	STATES AND TERRITORIES.	CAPITAL.											
		Number of establishments reporting.	Aggregate.	Value of plant.						Live assets.			
				Total.	Land.	Buildings.	Ovens.	Machinery, tools, and implements.	Railway plant and water supply.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States..	218	$17,462,729	$15,980,284	$1,405,342	$869,725	$10,817,624	$823,790	$2,063,803	$1,482,445	$186,751	$110,822	$1,184,872
2	Alabama	19	1,368,238	1,338,792	39,425	44,425	1,111,454	65,925	77,563	29,446	2,358	11,413	15,675
3	Colorado	7	594,393	561,040	600	20,500	471,341	33,813	34,786	33,353	3,100	19,025	11,228
4	Indiana	3	48,930	48,700	1,500	2,500	36,200	3,500	5,000	230	30	200	.....
5	Kansas	6	17,960	17,040	600	75	15,550	815	.....	920	100	820	.....
6	Kentucky	5	80,670	77,120	1,100	8,700	40,500	8,070	18,750	3,550	1,200	500	1,850
7	Missouri	3	5,275	5,275	.....	.....	4,450	825	.....	.....	.....	.....	.....
8	Ohio	13	320,215	306,846	14,800	134,516	124,550	27,030	5,950	13,369	6,320	3,880	3,169
9	Pennsylvania	98	12,000,820	10,962,717	1,068,372	562,962	7,014,347	561,779	1,755,257	1,038,103	15,727	38,900	983,476
10	Tennessee	8	541,350	493,350	6,800	6,500	450,750	17,300	12,000	48,000	2,000	8,500	37,500
11	West Virginia	45	1,716,837	1,592,526	213,345	70,097	1,111,582	60,123	137,379	124,311	3,081	4,256	116,974
12	All other states and territories. (a)	11	768,041	576,878	58,800	19,450	436,900	44,610	17,118	191,163	152,835	23,328	15,000

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.				MATERIALS USED.						
		Pieceworkers.				Aggregate cost.	Coal.					
		Males above 16 years.		Children.			Total.		Run of mine or lump.			
									Unwashed.		Washed.	
		Number.	Wages.	Number.	Wages.		Tons.	Cost.	Tons.	Cost.	Tons.	Cost.
1	The United States..	4,494	$2,162,662	24	$3,950	$11,509,737	15,795,087	$11,110,700	11,631,436	$8,255,542	421,074	$305,983
2	Alabama	709	287,808	20	3,350	1,810,274	1,789,047	1,755,876	1,348,104	1,324,386	.....	.....
3	Colorado	109	76,178	.....	.....	408,183	323,731	399,778	41,680	64,270	.....	.....
4	Indiana	4	1,264	.....	.....	20,133	16,428	16,156	5,928	13,260	.....	.....
5	Kansas	1	150	.....	.....	9,099	21,600	9,011	.....	.....	.....	.....
6	Kentucky	11	3,848	.....	.....	14,155	25,192	13,542	2,942	2,830	.....	.....
7	Missouri	.....	.....	.....	.....	3,557	8,485	3,118	.....	.....	.....	.....
8	Ohio	46	21,936	.....	.....	125,565	134,178	123,992	85,514	82,967	.....	.....
9	Pennsylvania	3,027	1,583,121	.....	.....	7,280,566	11,336,985	6,992,573	9,435,269	5,984,218	316,905	201,617
10	Tennessee	82	34,354	4	600	532,493	619,016	523,400	264,462	263,815	.....	.....
11	West Virginia	368	103,702	.....	.....	709,576	1,025,885	686,570	304,815	257,191	81,769	37,166
12	All other states and territories.	137	50,301	.....	.....	596,136	494,540	586,684	144,722	262,605	22,400	67,200

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Georgia, 1; Illinois, 2; Indian territory, 1; Montana, 2; Utah, 1; Virginia, 2; Washington, 1; Wisconsin, 1.

MANUFACTURE, BY STATES AND TERRITORIES: 1889.

MISCELLANEOUS EXPENSES.								AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.									
								Aggregates.		Officers, firm members, and clerks.				Operatives, skilled and unskilled.			
										Males above 16 years.		Females above 15 years.		Males above 16 years.		Children.	
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Amount paid to contractors.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
$394,784	$10,716	$78,284	$10,633	$54,144	$59,501	$39,204	$142,302	9,159	$4,186,264	160	$113,332	1	$300	4,448	$1,901,456	32	$4,564
7,994	225	4,584	.....	900	.....	1,245	1,040	1,128	436,948	8	4,805	.....	.....	376	138,645	15	2,340
1,360	.....	860	300	200	.....	.....	.....	253	166,735	6	5,070	.....	.....	138	85,487	.....	.....
290	.....	65	.....	100	.....	.....	125	22	8,164	.....	.....	.....	.....	18	6,900	.....	.....
565	.....	165	.....	200	.....	.....	200	19	5,845	.....	.....	.....	.....	18	5,695	.....	.....
436	.....	65	.....	170	.....	51	150	28	11,279	2	500	.....	.....	15	6,931	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	5	1,881	.....	.....	.....	.....	5	1,881	.....	.....
6,441	1,250	1,209	230	926	2,646	.....	180	143	65,388	3	1,664	.....	.....	94	41,788	.....	.....
256,263	6,011	61,913	7,369	35,811	3,432	20,767	120,960	5,954	2,976,692	98	73,500	1	300	2,825	1,319,326	3	445
41,862	.....	1,650	54	3,480	31,778	4,000	900	256	93,385	.....	.....	.....	.....	163	57,420	7	1,011
53,310	3,230	5,530	2,680	10,582	.....	12,641	18,647	1,074	310,268	40	25,898	.....	.....	659	179,905	7	768
26,263	.....	2,243	.....	1,775	21,645	500	100	277	109,679	3	1,900	.....	.....	137	57,478	.....	.....

MATERIALS USED—continued.					PRODUCTS.			OVENS, PITS, OR MOUNDS (NUMBER).						
Coal—Continued.														
Slack.				All other materials.	Total value.	Coke.		All other products.	Total.	Beehive ovens.	Belgian or flue ovens.	Other style ovens.	Pits or mounds	Washers. (Number.)	Crushers. (Number.)
Unwashed.		Washed.													
Tons.	Cost.	Tons.	Cost.	Cost.		Tons.	Value.	Value.							
3,195,322	$2,333,597	547,255	$215,578	$399,037	$16,496,345	10,008,169	$16,494,454	$3,891	32,659	32,129	233	278	19	51	33
431,943	426,990	9,000	4,500	54,398	2,474,377	1,055,823	2,474,377	.....	3,693	3,459	160	74	.....	2	4
282,051	335,508	.....	.....	8,405	673,479	199,638	673,479	.....	872	672	.....	200	.....	.....	.....
.....	.....	10,500	2,896	3,977	25,922	8,301	25,922	.....	102	102	.....	.....	.....	4	1
21,600	9,011	.....	.....	88	26,593	13,910	26,593	.....	52	52	.....	.....	.....	.....	.....
6,320	6,730	15,930	3,982	613	29,769	13,021	29,769	.....	164	164	.....	.....	.....	1	1
8,485	3,118	.....	.....	439	5,800	5,275	5,800	.....	9	9	.....	.....	.....	.....	.....
42,056	39,373	6,608	1,652	1,573	219,560	75,826	219,560	.....	462	462	.....	.....	.....	5	2
1,101,906	615,544	484,905	191,194	287,993	10,415,628	7,372,653	10,412,101	3,527	21,405	21,338	48	.....	19	31	14
349,519	254,550	5,035	5,035	9,093	726,004	356,964	726,004	.....	1,581	1,577	.....	4	.....	1	2
639,301	392,213	.....	.....	23,006	1,130,762	612,645	1,130,398	364	3,140	3,140	.....	.....	.....	2	5
312,141	250,560	15,277	6,319	9,452	770,451	294,113	770,451	.....	1,179	1,154	25	.....	.....	5	4

TABLE 3.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY, COKE MANUFACTURE, BY STATES AND TERRITORIES: 1889.

STATES AND TERRITORIES.	Number of establishments reporting.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. Aggregates. Average number.	Aggregates. Total wages.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Number.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Average weekly earnings per employé.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Total wages.	Clerks. Males above 16 years. Number.	Clerks. Males above 16 years. Average weekly earnings per employé.	Clerks. Males above 16 years. Total wages.	Clerks. Females above 15 years. Number.	Clerks. Females above 15 years. Average weekly earnings per employé.	Clerks. Females above 15 years. Total wages.
The United States	218	9,159	$4,186,264	37	$21.24	$33,297	123	$14.96	$80,035	1	$8.93	$300
Alabama	19	1,128	436,948	3	29.49	2,300	5	12.17	2,505	.....	.....	.....
Colorado	7	253	166,735	1	25.76	1,200	5	15.20	3,870	.....	.....	.....
Indiana	3	22	8,164	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas	6	19	5,845	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kentucky	5	28	11,279	1	11.54	300	1	7.69	200	.....	.....	.....
Missouri	3	5	1,881	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	13	143	65,388	.....	.....	.....	3	10.67	1,664	.....	.....	.....
Pennsylvania	98	5,954	2,976,692	15	20.59	14,900	83	15.81	58,600	1	8.93	300
Tennessee	8	256	93,385	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	45	1,074	310,268	17	21.05	14,597	23	12.73	11,296	.....	.....	.....
All other states and territories (a.)	11	277	109,679	.....	.....	.....	3	16.55	1,900	.....	.....	.....

STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued. Operatives, skilled and unskilled. Males above 16 years. Number.	Operatives, skilled and unskilled. Males above 16 years. Average weekly earnings per employé.	Operatives, skilled and unskilled. Males above 16 years. Total wages.	Children. Number.	Children. Average weekly earnings per employé.	Children. Total wages.	Pieceworkers. Number.	Pieceworkers. Total wages.	AVERAGE NUMBER OF HOURS IN ORDINARY DAY OF LABOR. May to November.	November to May.
The United States	4,448	$10.15	$1,901,456	32	$3.64	$4,564	4,518	$2,166,612	9.75	9.71
Alabama	376	8.00	138,645	15	3.96	2,340	729	291,158	9.68	9.58
Colorado	138	12.29	85,487	.....	.....	.....	109	76,178	9.86	9.86
Indiana	18	7.44	6,900	.....	.....	.....	4	1,264	9.33	9.33
Kansas	18	9.96	5,695	.....	.....	.....	1	150	9.58	9.58
Kentucky	15	10.73	6,931	.....	.....	.....	11	3,848	9.70	9.30
Missouri	5	9.98	1,881	.....	.....	.....	.....	.....	11.33	11.33
Ohio	94	9.03	41,788	.....	.....	.....	46	21,936	9.75	9.75
Pennsylvania	2,825	10.99	1,319,326	3	3.80	445	3,027	1,583,121	9.68	9.66
Tennessee	163	7.71	57,420	7	2.89	1,011	86	34,954	9.75	9.75
West Virginia	659	7.91	179,905	7	3.92	768	368	103,702	9.84	9.82
All other states and territories	137	9.73	57,478	.....	.....	.....	137	50,301	9.90	9.70

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (b)

STATES AND TERRITORIES.	Males above 16 years. Total number.	Under $5	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Females above 15 years. $8 and over but under $9.	Children. Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.
The United States	4,608	19	13	345	1,072	704	853	289	895	316	26	76	1	32	29	2	1
Alabama	384	1	2	158	93	32	57	3	24	6	1	7	.....	15	15	.....	.....
Colorado	144	.....	.....	1	.....	.....	59	6	28	41	4	5	.....	.....	.....	.....	.....
Indiana	18	.....	.....	4	11	2	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas	18	.....	.....	.....	1	1	12	2	1	1	.....	.....	.....	.....	.....	.....	.....
Kentucky	17	.....	1	1	1	4	5	1	2	2	.....	.....	.....	.....	.....	.....	.....
Missouri	5	.....	.....	.....	.....	2	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	97	.....	.....	13	42	3	12	7	19	.....	.....	1	.....	.....	.....	.....	.....
Pennsylvania	2,923	5	1	40	407	585	587	230	767	239	14	48	1	3	3	.....	.....
Tennessee	163	7	8	72	10	14	35	7	9	1	.....	.....	.....	7	7	.....	.....
West Virginia	699	6	1	56	448	60	50	27	18	19	5	9	.....	7	4	2	1
All other states and territories.	140	.....	.....	.....	59	1	36	3	26	7	2	6	.....	.....	.....	.....	.....

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Georgia, 1; Illinois, 2; Indian territory, 1; Montana, 2; Utah, 1; Virginia, 2; Washington, 1; Wisconsin, 1.

b In comparing the weekly rates of wages and number of employés at each rate with the average weekly earnings, it must be remembered that it is not practicable *to obtain true* average weekly earnings from the table of weekly rates, because the term of employment varies for employés reported at the respective rates.

REFINING OF PETROLEUM.

TABLE 3.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY, COKE MANUFACTURE, BY STATES AND TERRITORIES: 1889.

STATES AND TERRITORIES.	Number of establishments reporting.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. Aggregates. Average number.	Aggregates. Total wages.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Number.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Average weekly earnings per employé.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Total wages.	Clerks. Males above 16 years. Number.	Clerks. Males above 16 years. Average weekly earnings per employé.	Clerks. Males above 16 years. Total wages.	Clerks. Females above 15 years. Number.	Clerks. Females above 15 years. Average weekly earnings per employé.	Clerks. Females above 15 years. Total wages.
The United States	218	9,159	$4,186,264	37	$21.24	$33,297	123	$14.96	$80,035	1	$8.93	$300
Alabama	19	1,128	436,948	3	29.49	2,300	5	12.17	2,505			
Colorado	7	253	166,735	1	25.76	1,200	5	15.20	3,870			
Indiana	3	22	8,164									
Kansas	6	19	5,845									
Kentucky	5	28	11,279	1	11.54	300	1	7.69	200			
Missouri	3	5	1,881									
Ohio	13	143	65,388				3	10.67	1,664			
Pennsylvania	98	5,954	2,976,692	15	20.59	14,900	83	15.81	58,600	1	8.93	300
Tennessee	8	256	93,385									
West Virginia	45	1,074	310,268	17	21.05	14,597	23	12.73	11,296			
All other states and territories (a)	11	277	109,679				3	16.55	1,900			

STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued. Operatives, skilled and unskilled. Males above 16 years. Number.	Males above 16 years. Average weekly earnings per employé.	Males above 16 years. Total wages.	Children. Number.	Children. Average weekly earnings per employé.	Children. Total wages.	Pieceworkers. Number.	Pieceworkers. Total wages.	AVERAGE NUMBER OF HOURS IN ORDINARY DAY OF LABOR. May to November.	November to May.
The United States	4,448	$10.15	$1,901,456	32	$3.64	$4,564	4,518	$2,166,612	9.75	9.71
Alabama	376	8.00	138,645	15	3.96	2,340	729	291,158	9.68	9.58
Colorado	138	12.29	85,487				109	76,178	9.86	9.86
Indiana	18	7.44	6,900				4	1,264	9.33	9.33
Kansas	18	9.96	5,695				1	150	9.58	9.58
Kentucky	15	10.73	6,931				11	3,848	9.70	9.30
Missouri	5	9.98	1,881						11.33	11.33
Ohio	94	9.03	41,788				46	21,936	9.75	9.75
Pennsylvania	2,825	10.99	1,319,326	3	3.80	445	3,027	1,583,121	9.68	9.66
Tennessee	163	7.71	57,420	7	2.89	1,011	86	34,954	9.75	9.75
West Virginia	659	7.91	179,905	7	3.92	768	368	103,702	9.84	9.82
All other states and territories	137	9.73	57,478				137	50,301	9.90	9.70

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (b)

STATES AND TERRITORIES.	Males above 16 years. Total number.	Under $5	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Females above 15 years. $8 and over but under $9.	Children. Total number.	Children. Under $5.	Children. $5 and over but under $6.	Children. $6 and over but under $7.
The United States	4,608	19	13	345	1,072	704	853	289	895	316	26	76	1	32	29	2	1
Alabama	384	1	2	158	93	32	57	3	24	6	1	7		15	15		
Colorado	144			1			59	6	28	41	4	5					
Indiana	18			4	11	2		1									
Kansas	18				1	1	12	2	1	1							
Kentucky	17		1	1	1	4	5	1	2	2							
Missouri	5					2		2	1								
Ohio	97			13	42	3	12	7	19			1					
Pennsylvania	2,923	5	1	40	407	585	587	230	767	239	14	48	1	3	3		
Tennessee	163	7	8	72	10	14	35	7	9	1				7	7		
West Virginia	699	6	1	56	448	60	50	27	18	19	5	9		7	4	2	1
All other states and territories.	140				59	1	36	3	26	7	2	6					

a Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Georgia, 1; Illinois, 2; Indian territory, 1; Montana, 2; Utah, 1; Virginia, 2; Washington, 1; Wisconsin, 1.

b In comparing the weekly rates of wages and number of employés at each rate with the average weekly earnings, it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés reported at the respective rates.

REFINING OF PETROLEUM.

REFINING OF PETROLEUM.

BY JOSEPH D. WEEKS.

This report presents the statistics concerning the refining of petroleum during the year ending December 31, 1889. The production of crude petroleum is the subject of a separate report, and is not included in the statistics of manufactures. The refining of petroleum was part of a distinct report at the Tenth Census, and the statistics were not included in the report on manufactures.

While the increase in investment and production in this industry has kept pace with the development in other branches of manufacture during the decade from 1880 to 1890, the number of establishments remains practically the same as reported at the census of 1880. The extension to new oil fields of the pipe line systems for the transportation of crude petroleum rendered unnecessary a change in the location of refineries, this location being governed generally not so much by proximity to the sources of the raw materials as by its availability for the distribution of the refined product to domestic and foreign markets.

The following comparative summary shows the statistics concerning petroleum refining under the principal heads of the inquiry at the censuses of 1880 and 1890, also the percentages of increase:

COMPARATIVE SUMMARY, PETROLEUM REFINING: 1880 AND 1889.

ITEMS.	1880	1889	Percentage of increase.
Number of establishments reporting	86	94	9.30
Capital	$27,325,746	$77,416,296	183.31
Miscellaneous expenses (*a*)	.....	$2,069,268	.....
Average number of employés (aggregate)	9,869	12,471	26.37
Total wages	$4,381,572	$6,989,478	59.52
Officers, firm members, and clerks: (*b*)			
Average number	.....	1,068	.....
Total wages	.....	$1,117,011	.....
All other employés: (*b*)			
Average number	.....	11,403	.....
Total wages	.....	$5,872,467	.....
Cost of materials used	*c*$34,999,101	$67,918,723	94.06
Value of products (*d*)	$43,705,218	$85,001,198	94.49

a This item was not reported at the Tenth Census and at the Eleventh Census some establishments failed to furnish information as to miscellaneous expenses.
b Not reported separately at the census of 1880.
c The value of packages made is included in this amount, instead of, as in 1889, the cost of materials used in making them.
d The value of packages made at the refinery is not shown as a distinct item of product in the report for 1880, and does not appear to have been included in the value of products.

The number of establishments given in the above summary and in the appended tables should not be taken as the total number of refineries, for when 2 or more refineries owned by the same corporation, firm, or individual are located in the same county or city, they are considered and counted in the tabulations of this office as 1 establishment. There appear to have been 106 separate refineries in operation in the United States during the year 1889, and they are covered by the returns of the 94 establishments.

Previous census reports show no items entering into the cost of manufacture other than wages paid and cost of materials. The present inquiry was intended to cover as far as possible the entire cost of production except interest on capital and depreciation of plant. The cost of selling and mercantile losses are not included. It, therefore, would be erroneous to assume that the difference between the cost as shown by the sum of miscellaneous expenses, wages, and materials and the value of product represents the profit or earnings of capital invested.

Confined as the industry is to a comparatively few states, and several of these states having less than 3 establishments, it is possible to publish separately totals only for the states of New Jersey, New York, Ohio, Pennsylvania, and West Virginia without disclosing the operations of individual establishments. The statistics published at the census of 1880 were confined to the totals for the United States. The only comparison possible for the industry in the several states is presented in the statement on the following page, showing the number of refineries in operation in each state and in the United States at the two census periods.

COMPARATIVE STATEMENT OF NUMBER OF REFINERIES, PETROLEUM REFINING, BY STATES: 1880 AND 1889.

STATES.	NUMBER OF REFINERIES.	
	1880	1889
The United States	89	106
California	.....	2
Colorado	.....	2
Kentucky	1	.....
Maryland	3	3
Massachusetts	5	1
Maine	1	.....
New Jersey	2	5
New York	21	16
Ohio	18	15
Pennsylvania	33	58
West Virginia	5	4

CAPITAL.

The following statement shows the number of establishments and the detailed items of capital for both active and idle establishments, as reported at the Eleventh Census:

STATEMENT OF CAPITAL, ACTIVE AND IDLE ESTABLISHMENTS, PETROLEUM REFINING: 1889.

ITEMS.	Active establishments.	Idle establishments.
Number of establishments reporting	94	7
Capital—aggregate	$77,416,296	$423,508
Land	7,886,668	81,700
Buildings	6,403,994	215,690
Machinery, tools, and implements	20,837,038	104,889
Raw materials	3,089,803	12,429
Stock in process and finished products on hand	10,386,521	.....
Cash, bills and accounts receivable, and all sundries not elsewhere reported.	28,812,272	8,800

The average amount of capital to each idle establishment is $60,501 as compared with $823,578, the average capital of active establishments. There were 101 active and idle establishments in the United States during the year with an aggregate capital of $77,839,804. The amount of idle capital is but 0.54 per cent of the total amount invested in the industry. The total number of refineries in the United States, both active and idle, during the year was 113. The following statement presents the statistics concerning capital in idle establishments in the different states:

STATEMENT OF CAPITAL, IDLE ESTABLISHMENTS, PETROLEUM REFINING, BY STATES: 1889.

STATES.	Number of establishments reporting.	CAPITAL.						
		Aggregate.	Value of plant.				Live assets.		
			Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
The United States	7	$423,508	$402,279	$81,700	$215,690	$104,889	$21,229	$12,429	$8,800
California	1	28,118	27,789	600	400	26,789	329	329	.....
Ohio	2	12,600	12,600	800	2,700	9,100	.....	.....	.....
Pennsylvania	3	372,790	351,890	79,800	204,590	67,500	20,900	12,100	8,800
West Virginia	1	10,000	10,000	500	8,000	1,500	.....	.....	.....

The amount of capital required to produce $100 worth of product was $62.52 in 1880 and $91.08 in 1889; while the value of raw materials entering into $100 worth of product in 1880 was $80.08, and $79.90 in 1889. If we look at the wage cost necessary to the production of $100 worth of product in this industry we find that in 1880 it was $10.03, while in 1889 it was only $8.22. The investment of capital to secure a given value of product increases, while the wage cost of the like product decreases, the value of the materials remaining practically the same.

EMPLOYÉS AND WAGES.

In making comparisons of employés and wages at the two censuses it should be remembered that the schedule of inquiry used at the Eleventh Census provided for a more thorough exposition of the different classes of employés and wages. The classification of employés made at the Tenth Census was that of males above 16 years, females above 15 years, and children.

The classification used at the Eleventh Census was as follows: first, operatives, engineers, and other skilled workmen, overseers, and foremen or superintendents (not general superintendents or managers); second, officers or firm members; third, clerks; fourth, watchmen, laborers, teamsters, and other unskilled workmen; fifth, pieceworkers not included in the foregoing.

A further division of the above classes into males above 16 years, females above 15 years, and children was required.

The following statement presents the average number and total wages of employés reported for each class, and the percentage, the number and wages, in each class is of the totals reported for the industry:

STATEMENT OF EMPLOYÉS AND WAGES, BY CLASSES, WITH PERCENTAGE OF EACH CLASS TO TOTAL, PETROLEUM REFINING: 1889.

CLASSES OF EMPLOYÉS.	Average number.	Percentage.	Total wages	Percentage.
Total	12,471	100 00	$6,989,478	100.00
Officers or firm members	87	0.70	202.120	2.89
Clerks	981	7.87	914,891	13.09
Skilled	3,821	30.64	2,703,904	38.69
Unskilled	5,908	47.37	2,456,270	35.14
Pieceworkers	1,674	13.42	712,293	10.19

The following statement shows the proportion of males above 16 years, females above 15 years, and children to the whole number of employés reported for the industry:

STATEMENT OF MALES ABOVE 16 YEARS, FEMALES ABOVE 15 YEARS, AND CHILDREN, AND PERCENTAGE OF EACH CLASS TO TOTAL, PETROLEUM REFINING: 1889.

CLASSES OF EMPLOYÉS.	Average number.	Percentage.
Total	12,471	100.00
Males above 16 years	11,920	95.58
Females above 15 years	35	0.28
Children	516	4.14

The following statement, obtained from Table 3, shows the average number of males, females, and children reported at the different weekly rates of wages. The number includes officers, firm members, and clerks, but not those employed on piecework.

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK, PETROLEUM REFINING: 1889.

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	10,262	35	500
Under $5	294	.....	439
$5 and over but under $6	89	3	18
$6 and over but under $7	288	1	43
$7 and over but under $8	566	1	.....
$8 and over but under $9	361	23	.....
$9 and over but under $10	2,477	2	.....
$10 and over but under $12	1,924	1	.....
$12 and over but under $15	2,216	3	.....
$15 and over but under $20	1,199	.....	.....
$20 and over but under $25	375	1	.....
$25 and over	473	.....	.....

From the foregoing statements it appears that 95.58 per cent of all the employés reported for the industry are men, and that of the 10,262 men reported as receiving wages according to time, 7,816, or 76.16 per cent, received $9 and over but under $20 a week. The number of females reported is insignificant, being but 35 as compared with 25 shown at the Tenth Census. Of the 35 females, 33 are reported as clerks, 23 of whom received from $8 to $9 a week.

The schedule of inquiry called for a statement showing distinctive classes of employés according to their occupations and the daily rates of wages in each class.

The answers to these questions were not complete; they accounted for only 2,804 employés, or 22.48 per cent of the total number of employés reported for the industry. It is believed, however, that the number of employés reported is sufficient to warrant the use of the figures as an indication of the average daily wages for the different classes of employés in this industry, and the following statement presents the number of employés reported for each class, also the range and average daily rates of their wages:

STATEMENT OF THE EMPLOYÉS REPORTED BY OCCUPATIONS, WITH RANGE OF DAILY WAGES AND AVERAGE DAILY WAGES, PETROLEUM REFINING: 1889.

OCCUPATIONS.	Number of employés.	Range of daily wages.	Average daily wages.
Barrel house men	37	$1.25 to $2.75	$1.68
Boiler makers	31	2.25 to 2.65	2.62
Boiler men	20	1.50 to 3.00	2.06
Bone burners	17	1.60 to 2.50	2.26
Bookkeepers	9	2.31 to 4.00	3.66
Carpenters	93	2.25 to 3.00	2.57
Clerks	155	1.20 to 5.77	2.94
Compounders	4	2.00 to 6.00	3.44
Coopers	248	1.25 to 2.75	2.16
Drivers	43	1.50 to 4.50	2.11
Engineers	36	1.75 to 3.85	2.34
Filter house men	24	1.75 to 3.00	2.22
Firemen	52	1.20 to 2.50	1.99
Foremen	78	1.92 to 5.00	3.22
Laborers	982	0.96 to 2.50	1.61
Machinists	22	2.00 to 3.00	2.55
Pipe fitters	48	1.75 to 3.00	2.18
Pressmen	59	1.50 to 2.69	1.87
Stillmen	261	1.20 to 3.75	2.26
Superintendents	15	2.56 to 9.62	5.31
Tinners	8	2.00 to 3.33	2.39
Treaters	84	1.75 to 4.00	2.15
Various mechanics	403	1.75 to 4.00	2.15
Watchmen	31	1.00 to 2.25	1.77
Yardmen	44	1.20 to 2.00	1.69

MATERIALS USED.

During the year covered by this report there were 1,287,830,402 gallons of crude petroleum, or 30,662,629 barrels of 42 gallons each used by petroleum refiners, costing $44,879,783, an average cost of $1.46 per barrel. The cost of the crude petroleum is the cost at the refinery, including all charges for transportation. Of this quantity of crude petroleum, by far the greatest proportion, 1,232,868,858 gallons, was reported by the refineries as obtained through transportation companies, either by pipe lines or tank cars, 52,732,849 gallons being obtained direct from the wells and 2,228,695 gallons from all other sources, in barges and barrels.

The distillates were treated principally by the use of sulphuric acid, 95,916 tons of this acid being used, valued at $1,516,728. Hydrochloric and other acids and sulphur were also used. An effort was made to ascertain the disposition that was made of the resultant sludge acid, but the returns were so deficient in that respect as to make the data obtained far from complete. According to the returns, 33,911 tons were disposed of to manufacturers of fertilizers and chemicals, 19,962 tons to sulphuric acid manufacturers for restoration, and 7,701 tons were permitted to run to waste.

The cost of fuel constituted 3.35 per cent of the total cost of materials used in petroleum refining. The following statement shows the kinds, quantities, and cost of fuel used during the year 1889:

STATEMENT OF KIND, QUANTITY, AND COST OF FUEL, PETROLEUM REFINING: 1889.

KINDS OF FUEL.	Quantity.	Cost.
Total		$2,275,468
Anthracite coal.....tons..	324,393	566,114
Bituminous coal.....do...	351,355	750,041
Coke.....bushels..	82,976	6,225
Naphtha.....barrels..	116,762	111,328
Residuum (not produced at works).....do...	468,374	544,281
Wood.....cords..	1,948	2,691
Crude oil.....barrels..	73,567	36,330
Distillate.....do...	6,174	8,864
Natural gas		249,594

Anthracite coal in the form of culm is used largely in refineries on the Atlantic coast. Anthracite coal is reported at an average cost per ton of $1.75 as compared with $2.13 per ton for bituminous coal. Of the residuum reported as fuel, 399,243 barrels were consumed in the refineries located in the state of New York. The amount paid for natural gas, $249,594, represents approximately the consumption of 209,658,960 gallons of crude oil, as refiners, except those having their own supply, were generally charged for its use at the rate of 5 cents per barrel of crude oil used.

The manufacture and repair of barrels and cases at the refineries required an outlay of $6,856,308 for staves, heading, lumber, iron hoops, shooks, and sundries, and the manufacture of tin cans $5,639,292. The total expenditure for packages, ready made barrels, tin cans, and cases was $4,340,274, making an aggregate expenditure for packages of $16,835,874, or 24.79 per cent of the total cost of materials. This amount is exclusive of the wages of coopers, tinners, and carpenters and other employés engaged in this work.

PRODUCTS.

The general products obtained by the distillation of crude petroleum are naphthas or the lighter hydrocarbons, illuminating oils, heavy oils, or lubricants, residuum, and paraffine. Owing, however, to the marked differences in the composition of crude petroleum obtained from different districts and in the methods of refining, the distillates obtained vary widely in character and quantity. The following statement shows for the United States the average percentage that each product is of the total quantity of crude material consumed:

Total	100.00
Naphthas	12.73
Burning oils	65.64
Heavy oils or lubricants	4.99
Paraffine	3.59
Residuum	4.62
Residual products and loss	8.43

The following statement shows the average percentages of the several products obtained from the crude oil of western Pennsylvania, as returned by a refiner drawing his entire supply of crude oil from that field:

Total	100.00
Naphthas	10.07
Burning oils	70.54
Heavy oils or lubricants	8.94
Paraffine	3.24
Residual products and loss	7.21

As compared with the crude oil obtained from western Pennsylvania, eastern Ohio, New York, and West Virginia, the crude oil of the Lima district distills a smaller proportion of illuminating oil, as shown by the following statement, which is the result obtained by a refiner using Lima oil during the year:

Total	100.00
Naphthas	39.27
Burning oils	51.64
Paraffine	7.39
Loss	1.70

The base of California oil is usually asphaltum, in this respect differing from the petroleum obtained from other states, of which generally paraffine is the basis. The average percentages of the several products obtained during the year by refiners in California are as follows:

Total	100.00
Naphthas	5.25
Burning oils	6.94
Lubricants	5.58
Residuum	68.47
Maltha	13.76

The percentages of products obtained from the crude oil of the Florence field in Colorado, as returned by a refiner in that district, are as follows:

Total	100.00
Burning oils	32.21
Lubricants	1.58
Residuum	64.29
Loss	1.92

The oils of Texas, so far as reported during the year, are natural lubricating oils requiring only filtration to fit them for use, and are therefore not included within the scope of this report.

The foregoing statements of products are taken from the reports of individual refineries, as returned to this office, except that for the United States, which is the average of the whole number of returns. They can not be taken as a correct indication of the crude oils obtained from the several districts cited as, owing to the varied requirements of the different refineries and the wide difference in the methods employed, the percentages of the several products manufactured are capable of innumerable variations.

Owing to a difference in the classification of the refined products reported at the censuses of 1880 and 1890, it is not possible to make a complete comparison of the several products. The following comparative statement presents the items common to the two census reports. Rhigolene, mineral sperm, and deodorized lubricating oils for 1880, and neutral filtered oils, filtered cylinder oils, ointments, and greases for 1889, are included in all other petroleum products.

The following statement presents the quantities and values and the average value of the several products for 1880 and 1889, with the percentage of increase or decrease in quantity and value:

COMPARATIVE STATEMENT, QUANTITY, TOTAL VALUE OF PRODUCTS, AVERAGE VALUE PER BARREL, AND THE PERCENTAGE OF INCREASE IN QUANTITY AND IN TOTAL VALUE, PETROLEUM REFINING: 1880 AND 1889.

PRODUCTS.	1880			1889			PERCENTAGE OF INCREASE.	
	Number of barrels.	Total value.	Average value per barrel.	Number of barrels.	Total value.	Average value per barrel.	In quantity.	In total value.
Burning oils	11,002,249	$36,839,613	$3.35	16,907,397	$47,842,537	$2.82	54.22	29.87
Residuum	229,133	297,529	1.30	1,194,967	1,235,490	1.03	421.52	315.25
Paraffine oils	79,465	408,023	5.13	684,849	3,022,048	4.41	761.82	640.66
Paraffine wax	a7,889,626	631,944	b0.08	241,951	2,904,902	12.01	.....	359.68
Reduced oils	230,859	1,395,037	6.04	856,730	2,333,923	2.72	271.11	67.30
Gasoline	289,555	1,128,166	3.90	101,064	394,676	3.91	c65.10	c65.02
Naphtha	1,212,626	1,833,395	1.51	3,189,398	6,720,712	2.11	163.02	266.57
All other petroleum products	.....	1,171,511	.....	.....	5,288,856	.....	.....	351.46

a Pounds. b Average value per pound. c Decrease.

The schedule of inquiry required a more complete and detailed description of the different products manufactured than is presented in the tables accompanying this report, such as the fire test of illuminating oils, the color and specific gravity of other products, but the replies received to these questions were so incomplete as to render the information of no value for statistical purposes.

With the manifold uses to which the refined products of crude petroleum are put in the manufacture of mixed lubricants, pharmaceutical preparations, wool cleansing oils, and other articles, this investigation has no direct connection, and they are not considered in this discussion.

The following statement shows the quantities of the several petroleum products manufactured during the census year for domestic consumption and for export, as returned by refineries, with the percentage that each class is of the whole quantity of such product manufactured:

STATEMENT OF PRODUCTS MANUFACTURED FOR HOME CONSUMPTION AND FOR EXPORT, WITH PERCENTAGE OF TOTALS, PETROLEUM REFINING: 1889.

PRODUCTS.	For home consumption. (Barrels.)	Per centage of total.	For export. (Barrels.)	Per centage of total.
Total	12,946,112	54.09	10,724,634	45.31
Burning oils	6,936,256	40.88	10,031,141	59.12
Residuum	1,189,564	99.55	5,403	0.45
Paraffine oils	357,653	52.22	327,196	47.78
Reduced oils	763,752	89.15	92,978	10.85
Neutral filtered oils	109,832	97.43	2,892	2.57
Filtered cylinder oils	269,058	96.58	9,515	3.42
Ointments and greases	28,389	65.88	14,704	34.12
Gasoline and naphtha	3,199,709	97.24	90,753	2.76
Paraffine wax	91,899	37.98	150,052	62.02

EQUIPMENT OF PLANT.

The following statement presents by totals for the United States and the several states having 3 or more establishments the equipment of plant as regards power, buildings, storage, and transportation facilities of petroleum refineries:

EQUIPMENT OF PLANT, PETROLEUM REFINING, BY STATES: 1889.

STATES.	STEAM POWER.			BUILDINGS (NUMBER).								STORAGE AND TRANSPORTATION (NUMBER).							
						Stills.						Storage tanks.							
	Boilers. (Number.)	Engines. (Number.)	Horse power.	Cooper shops.	Tin shops.	Heated by steam.	Heated by superheated steam.	Heated by fire.	Agitators.	Chilling houses for paraffine.	Presses. (Number.)	For crude petroleum.	For refined petroleum.	Tank cars.	Tank wagons.	Barges.	Steamships or other tank boats.	Towboats or lighters.	Horses and mules.
The United States	578	545	36,281	31	20	217	61	997	306	39	767	292	1,861	893	75	19	6	26	361
New Jersey	99	220	11,036	4	1	23	.....	188	52	6	86	22	375	50	.....	1	5	11	.....
New York	131	77	8,372	6	10	56	3	260	72	7	370	41	446	39	5	11	.....	7	115
Ohio	89	63	5,997	4	2	34	17	163	54	6	174	28	172	357	19	2	.....	3	63
Pennsylvania	213	164	8,223	12	3	86	36	305	98	17	133	161	707	351	34	1	.....	1	140
West Virginia	18	10	975	4	1	8	.....	20	12	2	2	16	18	.....	.....	1	.....	.....	4
All other states (a)	28	11	1,678	1	3	10	5	61	18	1	2	24	143	96	17	3	1	1	39

a Includes states in which there are less than 3 establishments, distributed as follows: California, 2; Colorado, 2; Maryland, 2, Massachusetts, 1.

TABULAR STATEMENTS.

The statistical tables accompanying this report are as follows:

Table 1 is a comparative statement for the United States of items common to both census periods.

Table 2 is a statement showing in detail the statistics concerning petroleum refining by totals for the United States and for the respective states. In addition to the various subdivisions of capital, miscellaneous expenses, employés and wages, materials and products, this table shows the source from which the crude petroleum was received, whether direct from wells or through transportation companies or other sources, also the quantity manufactured for domestic consumption and for export.

Table 3 is a presentation of the statistics of employés and wages. It shows the employés classified as (1) officers or firm members; (2) clerks; (3) operatives and skilled; (4) unskilled, and their further division by males, females, and children, with the actual wages paid to each class and the average weekly earnings per employé; (5) pieceworkers. It also shows the weekly rates of wages paid and the average number of employés, males, females, and children at each rate, not including pieceworkers.

The number of employés reported is the "average number employed during the year", that is, the average number having continuous employment for the full time reported by individual establishments. Upon this basis the computations are made to obtain the "average weekly earnings". The average number of employés reported

for each establishment is multiplied by the number of weeks the establisnment was in operation; the result is the number of weeks required for 1 employé to perform the labor. Aggregating such results of individual reports, the number of weeks required for 1 employé to perform the entire labor is obtained. This number, used as a divisor for the total wages reported, produces the true average weekly earnings.

In the appended tables and in all statements embodied in the text the barrel of crude oil is 42 gallons and that of the refined product is 50 gallons.

TABLE 1.—COMPARATIVE STATEMENT, PETROLEUM REFINING: 1880 AND 1889.

ITEMS.	1880		1889	
	Number or quantity.	Amount.	Number or quantity.	Amount.
Number of establishments reporting	86		94	
Capital		$27,325,746		$77,416,296
Miscellaneous expenses (a)				2,069,268
Average number of employés	9,869		12,471	
Males above 16 years	9,498		11,920	
Females above 15 years	25		35	
Children	346		516	
Total wages		4,381,572		6,989,478
Cost of materials used		34,999,101		67,918,723
Crude petroleum gallons	731,533,127	16,340,581	1,287,830,402	44,879,783
Naphtha do			100,000	4,000
Residuum do			4,530,000	123,205
Fuel total		1,319,008		2,275,468
Anthracite coal tons	179,997	446,922	324,393	566,114
Bituminous coal do	504,667	580,983	351,355	750,041
Wood cords	1,471	6,355	1,948	2,691
Coke bushels	303,596	13,218	82,976	6,225
Naphtha barrels	57,843	42,315	116,762	111,328
Residuum do	235,314	229,215	468,374	544,281
Oil do			73,567	36,330
Distillate do			6,174	8,864
Natural gas				249,594
Acids total		1,206,300		1,530,065
Sulphuric acid tons	45,814	1,206,052	95,916	1,516,728
All other acids		248		13,337
Packages bought, and coopers, carpenters, and tinners' materials total		15,964,627		16,835,874
Barrels number	6,424,608	7,577,805	3,791,010	3,885,344
Tin cans do	344,173	93,367	434,383	88,789
Cases do	4,845,504	717,400	2,770,479	366,141
Coopers, carpenters, and tinners' materials		b7,576,055		12,495,600
All other materials		168,585		2,270,328
Value of products (c) total		43,705,218		85,001,198
Burning oils barrels	11,002,249	36,839,613	16,967,397	47,842,537
Residuum do	229,133	297,529	1,194,967	1,235,490
Paraffine oils do	79,465	408,023	684,849	3,022,048
Reduced oils do	230,859	1,395,037	856,730	2,333,923
Gasoline do	289,555	1,128,166	101,064	394,676
Naphtha do	1,212,626	1,833,395	3,189,398	6,720,712
Paraffine wax do	d7,889,626	631,944	241,951	2,904,902
All other petroleum products		1,171,511		5,288,856
Packages made total		6,930,643		15,258,054
Barrels and cases number	4,899,995	4,230,013	32,345,323	8,924,625
Tin cans do	23,496,916	2,700,630	50,566,576	6,333,429

a This item was not reported at the Tenth Census, and at the Eleventh Census some establishments failed to furnish information as to miscellaneous expenses.
b This item includes the value of packages made instead of the cost of materials used in making them, as in 1889.
c The value of packages made at the refinery is not shown as a distinct item of product in the report for 1880, and does not appear to have been included in the value of the product.
d Pounds.

TABLE 2.—DETAILED STATEMENT,

	STATES.	Number of establishments reporting.	CAPITAL.								
			Aggregate.	Value of plant.				Live assets.			
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	94	$77,416,296	$35,127,700	$7,886,668	$6,403,994	$20,837,038	$42,288,596	$3,089,803	$10,386,521	$28,812,272
2	New Jersey	4	16,500,730	9,295,985	2,605,740	1,678,545	5,011,700	7,204,745	612 385	2,093,871	4,498,489
3	New York	9	24,166,205	10,153,412	2,395,743	1,607,786	6,149,883	14,012,793	1,123,201	3,370,924	9,518,668
4	Ohio	15	15,871,138	6,320,561	1,269,143	1,216,585	3,834,833	9,550,577	550,898	1,937,303	7,062,376
5	Pennsylvania	55	17,082,606	7,284,850	1,180,508	1,464,680	4,639,662	9,797,756	668,837	2,578,599	6,550,320
6	West Virginia	4	1,348,322	636,679	208,368	161,999	266,312	711,643	51,037	135,111	525,495
7	All other states (a)	7	2,447,295	1,436,213	227,166	274,399	934,648	1,011,082	83,445	270,713	656,924

	STATES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.								MATERIALS USED.			
		Operatives, skilled and unskilled—Continued.				Pieceworkers.				Aggregate cost.	Crude petroleum, naphtha, and residuum.		
		Females above 15 years.		Children.		Males above 16 years.		Children.			Total cost of crude petroleum, naphtha, and residuum.	Crude petroleum.	
		Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.			Total.	
												Gallons.	Cost.
1	The United States	2	$622	500	$81,635	1,658	$708,820	16	$3,473	$67,918,723	$45,006,988	1,287,830,402	$44,879,783
2	New Jersey					599	224,594			16,474,022	11,364,375	289,316,913	11,364,375
3	New York			88	15,755	339	131,499	8	1,624	20,979,247	12,448,191	350,095,305	12,448,191
4	Ohio			84	16,502	195	114,810	8	1,849	12,517,255	8,587,114	261,606,299	8,496,114
5	Pennsylvania	2	622	316	48,478	487	224,514			15,006,919	10,437,988	319,285,879	10,401,783
6	West Virginia			10	600	35	11,531			951,576	646,901	19,325,848	646,901
7	All other states			2	300	3	1,872			1,989,704	1,522,419	48,200,158	1,522,419

	STATES.	MATERIALS USED—continued.											
		Fuel.											
		Total cost.	Coal.				Coke.		Naphtha.		Residuum (not produced at works).		Wood.	
			Anthracite.		Bituminous.									
			Tons.	Cost.	Tons.	Cost.	Bushels.	Cost.	Barrels.	Cost.	Barrels.	Cost.	Cords.	Cost.
1	The United States	$2,275,468	324,393	$566,114	351,355	$750,041	82,976	$6,225	116,762	$111,328	468,374	$544,281	1,948	$2,691
3	New Jersey	411,847	219,021	357,365	4,696	14,098	14,820	1,871	18,966	36,913			400	1,600
2	New York	1,042,140	89,085	178,294	156,232	298,544	24,718	1,579	79,596	39,702	399,243	507,039	634	158
4	Ohio	210,086	334	1,000	73,007	158,381	23,814	1,522	9,976	19,030	40,000	6,000	608	153
5	Pennsylvania	522,974	15,953	29,455	82,122	205,999	16,033	1,024	6,717	12,813	29,131	31,242	209	477
6	West Virginia	25,460			20,788	23,944	1,744	111	733	1,394			44	11
7	All other states	62,961			14,510	49,075	1,847	118	774	1,476			53	292

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 2; Colorado, 2; Maryland, 2; Massachusetts, 1.

PETROLEUM REFINING, BY STATES: 1889.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.								
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Aggregates.		Officers, firm members, and clerks.				Operatives, skilled and unskilled.		
									Males above 16 years.		Females above 15 years.		Males above 16 years.		
							Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
$2,069,268	$70,525	$188,439	$110,104	$600,323	$174,466	$925,411	12,471	$6,980,478	1,035	$1,102,892	33	$14,119	9,227	$5,077,917	1
241,188	10,958	14,348	41,291	112,674	29,352	32,565	2,703	1,618,501	93	148,913	.....	.....	2,011	1,244,994	2
576,161	17,459	60,567	6,831	151,023	37,141	303,140	3,490	2,015,544	367	378,240	27	11,239	2,661	1,477,187	3
590,858	18,828	55,884	24,148	163,147	46,803	282,048	2,281	1,290,991	302	271,610	3	1,520	1,589	884,700	4
543,668	17,649	43,931	36,059	144,898	42,387	258,744	3,496	1,735,257	209	230,305	3	1,360	2,479	1,229,978	5
42,834	3,937	4,883	411	10,852	2,032	20,719	221	96,992	22	18,474	.....	.....	154	66,387	6
74,559	1,694	8,826	1,364	17,729	16,751	28,195	280	232,193	42	55,350	.....	.....	233	174,671	7

MATERIALS USED—continued.												
Crude petroleum, naphtha, and residuum—Continued.									Acids.			
Crude petroleum—Continued.						Naphtha.		Residuum.				
From transportation companies.		From wells.		From all other sources.					Total cost.	Sulphuric.		All other.
Gallons.	Cost.	Gallons.	Cost.	Gallons.	Cost.	Gallons.	Cost.	Gallons.	Cost.		Tons.	Cost.	Cost.	
1,238,868,858	$43,496,079	52,732,849	$1,314,269	2,228,695	$69,435	100,000	$4,000	4,530,000	$123,205	$1,530,065	95,916	$1,516,728	$13,337	1
289,316,913	11,364,375	.....	.....	.....	.....	.....	.....	.....	.....	342,514	23,445	342,514	.....	2
350,095,305	12,448,191	.....	.....	.....	.....	.....	.....	.....	.....	444,035	30,794	440,526	3,509	3
252,786,299	8,353,114	8,820,000	143,000	.....	.....	100,000	4,000	2,900,000	87,000	316,189	19,071	311,580	4,609	4
299,967,779	9,894,627	17,089,405	437,721	2,228,695	69,435	.....	.....	1,630,000	36,205	351,305	19,045	347,994	3,311	5
18,267,448	627,917	1,058,400	18,964	.....	.....	.....	.....	.....	.....	20,113	1,281	20,060	53	6
22,435,114	807,855	25,765,044	714,564	.....	.....	.....	.....	.....	.....	55,909	2,280	54,054	1,855	7

MATERIALS USED—continued.												
Fuel—Continued.					Packages.							
Crude oil.		Distillate.		Natural gas.	Total cost of coopers, carpenters, and tinners' materials, and packages bought.	Coopers and carpenters' materials.						
						Total cost.	Staves.		Heading.		Lumber.	
Barrels.	Cost.	Barrels.	Cost.	Cost.			Pieces.	Cost.	Sets.	Cost.	Feet.	Cost.
73,567	$36,330	6,174	$8,864	$249,594	$16,835,874	$6,856,308	91,314,885	$2,838,464	9,015,678	$814,021	376,103	$12,783	1
.....	.....	.....	.....	.....	4,295,267	2,826,396	35,489,260	1,263,128	3,767,311	337,833	.....	.....	2
.....	.....	.....	.....	16,824	6,202,619	2,040,114	19,390,126	568,535	1,894,774	170,198	109,809	8,640	3
64,667	23,700	.....	.....	300	2,736,143	880,235	14,602,302	450,593	1,604,247	130,288	105,415	1,760	4
900	630	6,174	8,864	232,470	3,091,520	963,259	19,485,264	483,681	1,499,593	154,945	144,977	2,118	5
.....	.....	.....	.....	.....	211,245	70,576	1,214,996	37,567	125,286	10,648	7,724	128	6
8,000	12,000	.....	.....	.....	299,080	75,728	1,132,937	34,960	124,467	10,109	8,178	137	7

TABLE 2.—DETAILED STATEMENT, PETROLEUM

	STATES.	MATERIALS USED—continued.									
		Packages—Continued.									
		Coopers and carpenters' materials—Continued.				Tinners' materials.					
		Iron hoops.		Shooks.	Sundries.	Total cost.	Tin.		Solder.		Sundries.
		Pounds.	Cost.	Cost.	Cost.		Boxes.	Cost.	Pounds.	Cost.	Cost.
1	The United States...	49,388,619	$1,120,376	$1,360,365	$710,299	$5,639,292	1,068,653	$5,139,595	2,594,933	$284,706	$214,991
2	New Jersey	20,068,026	461,800	444,258	319,377	838,976	159,484	777,035	425,322	48,072	13,869
3	New York	11,023,418	240,435	916,107	136,199	2,814,743	539,983	2,584,754	1,257,235	137,625	92,364
4	Ohio	8,396,148	179,203	.....	118,331	1,077,152	200,244	964,842	489,203	52,702	59,608
5	Pennsylvania	8,588,601	210,844	.....	111,671	724,652	134,825	649,647	329,392	35,485	39,520
6	West Virginia	668,757	14,281	.....	7,952	78,847	14,672	70,699	35,846	3,861	4,287
7	All other states	643,669	13,753	.....	16,769	104,922	19,445	92,618	57,935	6,961	5,343

	STATES.	PRODUCTS—continued.									
		Residuum.				Paraffine oils.				Reduced oils.			
		Total.		Home consumption. (Barrels.)	Exported. (Barrels.)	Total.		Home consumption. (Barrels.)	Exported. (Barrels.)	Total.		Home consumption. (Barrels.)	Exported. (Barrels.)
		Barrels.	Value.			Barrels.	Value.			Barrels.	Value.		
1	The United States...	1,194,967	$1,235,490	1,189,564	5,403	684,849	$3,022,048	357,653	327,196	856,730	$2,333,923	763,752	92,978
2	New Jersey	192,746	343,847	192,746	.....	139,975	642,443	52,676	87,299	145,856	537,143	91,282	54,574
3	New York	284,340	315,670	281,463	2,877	284,714	1,297,213	140,219	144,495	203,767	458,981	189,963	13,804
4	Ohio	237,696	144,995	236,851	845	139,434	573,393	87,091	52,343	164,795	365,663	151,485	13,310
5	Pennsylvania	208,619	196,443	207,067	1,552	103,238	436,937	68,062	35,176	299,230	861,296	289,949	9,281
6	West Virginia	11,229	4,803	11,167	62	7,798	30,873	3,970	3,828	31,165	75,433	30,190	975
7	All other states	260,337	229,732	260,270	67	9,690	41,189	5,635	4,055	11,917	35,407	10,883	1,034

	STATES.	PRODUCTS—continued.											
		Naphtha.				Paraffine wax.				Residuum products.			
		Total.		Home consumption. (Barrels.)	Exported. (Barrels.)	Total.		Home consumption. (Barrels.)	Exported. (Barrels.)	Coke. (Home consumption.)		Naphtha black. (Home consumption.)	
		Barrels.	Value.			Barrels.	Value.			Bushels.	Value.	Barrels.	Value.
1	The United States...	3,189,398	$6,720,712	3,098,654	90,744	241,951	$2,904,902	91,899	150,052	494,221	$56,997	437	$946
2	New Jersey	524,954	1,319,284	476,005	48,949	62,604	832,611	8,365	54,239	176,284	13,849	.....	.....
3	New York	836,086	1,674,730	818,743	17,343	77,772	911,284	32,307	45,465	129,722	13,399	158	342
4	Ohio	758,598	1,625,044	745,194	13,404	41,392	489,767	16,020	25,372	108,822	18,407	152	329
5	Pennsylvania	943,369	1,792,176	934,344	9,025	54,200	691,592	32,837	21,363	67,441	9,704	104	225
6	West Virginia	48,135	99,214	47,153	982	2,700	29,943	946	1,754	5,805	795	11	24
7	All other states	78,256	210,264	77,215	1,041	3,283	39,705	1,424	1,859	6,147	843	12	26

REFINING, BY STATES: 1889—Continued.

MATERIALS USED—continued.								PRODUCTS.					
Packages—Continued.									Burning oils.				
Packages bought.							All other materials.	Aggregate value.	Total.		Home consumption. (Barrels.)	Exported. (Barrels.)	
Total cost.	Barrels.		Tin cans.		Cases.								
	Number.	Cost.	Number.	Cost.	Number.	Cost.	Cost.		Barrels.	Value.			
$4,340,274	3,791,010	$3,885,344	434,383	$88,789	2,770,479	$366,141	$2,270,328	$85,001,198	16,967,397	$47,842,537	6,936,256	10,031,141	1
629,895	600,828	605,851	88,174	17,744	42,000	6,300	60,019	20,711,826	3,930,584	12,257,048	737,743	3,192,841	2
1,347,762	1,214,300	1,239,168	118,169	22,105	667,755	86,489	842,262	25,786,841	4,877,785	12,908,111	1,970,397	2,907,388	3
778,756	677,692	675,274	68,200	13,645	676,339	89,837	667,723	16,343,493	3,503,331	9,990,262	1,730,596	1,772,735	4
1,443,609	1,137,857	1,198,336	159,681	35,270	1,285,777	170,003	603,132	18,498,777	3,995,347	10,657,400	2,104,610	1,890,737	5
61,822	53,874	55,704	76	12	47,144	6,106	47,857	1,171,374	255,589	695,062	125,691	129,808	6
118,430	106,459	111,011	83	13	51,464	7,406	49,335	2,488,887	404,761	1,334,654	267,219	137,542	7

PRODUCTS—continued.														
Neutral filtered oils.				Filtered cylinder oils.				Ointments and greases.				Gasoline.			
Total.		Home consumption. (Barrels.)	Exported. (Barrels.)	Total.		Home consumption. (Barrels.)	Exported. (Barrels.)	Total.		Home consumption. (Barrels.)	Exported. (Barrels.)	Total.		Home consumption. (Barrels.)	Exported. (Barrels.)
Barrels.	Value.			Barrels.	Value.			Barrels.	Value.			Barrels.	Value.		
112,724	$435,351	109,832	2,892	278,573	$1,526,096	269,058	9,515	43,093	$789,089	28,389	14,704	101,064	$394,676	101,055	9	1
58,640	251,659	55,748	2,892	78,379	530,531	72,190	6,189	.....	.....	.....	.....	143	841	143	.....	2
6,392	10,477	6,392	.....	28,175	126,633	28,175	.....	33,535	747,025	18,957	14,578	25,600	104,143	25,600	.....	3
4,738	13,549	4,738	.....	27,048	120,192	27,048	.....	4,543	12,206	4,543	.....	20,844	89,026	20,839	5	4
42,348	156,874	42,348	.....	126,041	656,205	122,715	3,326	4,400	28,272	4,274	126	50,519	180,714	50,517	2	5
149	628	149	.....	1,908	8,515	1,908	.....	297	770	297	.....	1,528	6,523	1,527	1	6
457	2,164	457	.....	17,022	84,020	17,022	.....	318	816	318	.....	2,430	13,429	2,429	1	7

PRODUCTS—continued.											
All other products.											
Total value.	Value of by-products manufactured directly from petroleum.	Of cooper and carpenter shops.					Of tin shops.				
		Casks. (Number.)	Barrels. (Number.)	Half barrels. (Number.)	Less than half barrels. (Number.)	Value.	10-gallon cans (Number.)	5-gallon cans. (Number.)	Less than 5-gallon cans. (Number.)	Value.	
$17,738,431	$2,480,377	27,392,964	4,593,270	358,984	105	$8,924,625	239	50,029,001	537,336	$6,333,429	1
3,962,570	113,631	3,660,714	1,970,568	.....	.....	2,907,030	.....	7,324,329	34,722	901,909	2
7,218,833	725,152	14,908,901	987,368	55,749	.....	3,015,642	87	25,227,599	289,769	3,478,039	3
2,900,969	583,401	4,774,281	741,486	53,715	.....	1,263,035	83	9,449,181	115,677	1,054,224	4
2,920,929	752,346	3,256,801	774,486	241,415	105	1,455,588	56	6,445,807	78,914	713,005	5
218,791	35,424	349,839	61,833	3,936	.....	106,777	6	692,396	8,476	76,590	6
496,638	270,423	442,428	57,529	4,169	.....	116,553	7	889,689	9,778	109,662	7

TABLE 3.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYÉS

	STATES.	Number of establishments reporting.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS.										
			Aggregates.		Officers or firm members actively engaged in the industry or in supervision.			Clerks.					
					Males above 16 years.			Males above 16 years.			Females above 15 years.		
			Average number.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.
1	The United States...	94	12,471	$6,989,478	87	$48.51	$202,120	948	$19.07	$900,772	33	$8.74	$14,119
2	New Jersey	4	2,703	1,618,501	7	156.59	57,000	86	20.59	91,913	.....	.....	.....
3	New York	9	3,490	2,015,544	3	80.77	12,600	364	20.34	365,640	27	8.62	11,239
4	Ohio	15	2,281	1,290,991	14	38.65	26,125	288	16.55	245,485	3	9.74	1,520
5	Pennsylvania	55	3,496	1,735,257	52	34.68	83,175	157	20.31	147,130	3	8.72	1,360
6	West Virginia	4	221	96,992	3	65.51	10,220	19	8.58	8,254	.....	.....	.....
7	All other states (a)	7	280	232,193	8	31.25	13,000	34	24.07	42,350	.....	.....	.....

	STATES.	Average number of hours in ordinary day of labor.		WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (b)											
				Males above 16 years.											
		May to November.	November to May.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.
1	The United States...	10.20	10.14	10,262	294	89	288	566	361	2,477	1,924	2,216	1,199	375	473
2	New Jersey	10.00	9.88	2,104	105	27	51	29	20	440	377	469	396	131	59
3	New York	10.00	9.89	3,028	104	42	130	78	49	821	482	703	316	71	232
4	Ohio	10.13	10.00	1,991	51	17	45	134	123	359	553	392	153	88	76
5	Pennsylvania	10.29	10.25	2,688	29	.....	59	199	162	796	474	584	248	62	75
6	West Virginia	10.00	10.00	176	.....	1	.....	125	.....	32	4	1	7	3	3
7	All other states	10.14	10.14	275	5	2	3	1	7	29	34	67	79	20	28

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: California, 2; Colorado, 2; Maryland, 2; Massachusetts, 1.

AT THE DIFFERENT WEEKLY RATES OF PAY, PETROLEUM REFINING, BY STATES: 1889.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Operatives and skilled.						Unskilled.						Pieceworkers.						
Males above 16 years.			Females above 15 years.			Males above 16 years.			Children.			Summary.		Males above 16 years.		Children.		
Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Total wages.	Number.	Total wages.	Number.	Total wages.	
3,819	$14.05	$2,703,282	2	$5.98	$622	5,408	$8.94	$2,374,635	500	$3.59	$81,635	1,674	$712,293	1,658	$708,820	16	$3,473	1
1,165	14.53	878,690	.....	.....	.....	846	8.41	366,304	.....	.....	.....	599	224,594	599	224,594	.....	.....	2
834	14.49	620,325	.....	.....	.....	1,827	9.09	856,862	88	3.45	15,755	347	133,123	339	131,499	8	1,624	3
817	12.09	508,880	.....	.....	.....	872	8.38	375,820	84	3.78	16,502	203	116,659	195	114,810	8	1,849	4
871	14.39	580,348	2	5.98	622	1,608	9.32	649,630	316	3.68	48,478	487	224,514	487	224,514	.....	.....	5
26	8.77	11,400	.....	.....	.....	128	8.39	54,987	10	1.15	600	35	11,531	35	11,531	.....	.....	6
106	19.35	103,639	.....	.....	.....	127	10.87	71,032	2	2.88	300	3	1,872	3	1,872	.....	.....	7

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Females above 15 years.									Children.				
Total number.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$20 and over but under $25.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	
35	3	1	1	23	2	1	3	1	500	439	18	43	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
27	1	.....	.....	23	1	.....	1	1	88	88	.....	.....	3
3	.....	.....	1	.....	.....	1	1	.....	84	74	9	1	4
5	2	1	.....	.....	1	.....	1	.....	316	265	9	42	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	10	10	.....	.....	6
.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	.....	.....	7

b In comparing the weekly rates of wages and number of employés at each rate with the average weekly earnings, it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés reported at the respective rates.

GLUE.

GLUE.

GLUE.

BY R. W. POWELL.

The manufacture of glue in the United States is frequently so closely allied with other industries, such as slaughtering and meat packing, the manufacture of fertilizers, bone, ivory, and lamp black, and curled hair, that it is not practicable to keep the accounts so as to show specifically the items of capital, expenses, labor, and product that directly pertain to the production of glue. For this reason it was found impossible to compile complete statistics for the manufacture of glue as a distinct industry. The following figures, however, fairly represent the conditions of the industry as conducted during the census year ending May 31, 1890.

Complete returns were obtained for 57 establishments that reported the manufacture of glue as a sole or predominating product, and the following summary presents the data for these establishments under the general heads of the inquiry used at the Eleventh Census. The number of establishments shown in this statement does not agree with the number given in the general tables on manufactures in Part 1, because those tables include establishments engaged in the manufacture of ground glue and glue stock.

SUMMARY, GLUE MANUFACTURE: 1890.

Number of establishments reporting	57
Capital	$4,719,741
Miscellaneous expenses	$392,565
Average number of employés (aggregate)	1,795
Total wages	$788,099
Officers, firm members, and clerks:	
Average number	120
Total wages	$121,588
All other employés:	
Average number	1,675
Total wages	$666,511
Cost of materials used	$2,284,455
Value of products	$3,932,781

Table 1 accompanying this report gives in detail, by totals for groups of states, the data concerning capital, miscellaneous expenses, employés and wages, materials and products, embraced by the foregoing summary, the arrangement by groups being necessary in order to obviate a disclosure of the operations of individual establishments.

In addition to the data presented in Table 1, returns were received for 20 establishments engaged in other industries, but containing specific statements respecting the quantity and value of glue manufactured as a by-product. These establishments manufactured during the census year 7,641,948 pounds of glue, valued at $745,159. Adding these amounts to the 27,442,680 pounds, valued at $2,871,935, obtained from the tabulation of the complete reports presented in Table 1, we have a total of 35,084,628 pounds, valued at $3,617,094. It is evident, however, that these figures do not fully represent the quantity and value of the glue manufactured in the United States during the census year. In the returns for some of the establishments which are known to have manufactured glue as a by-product, neither its quantity nor its value was specifically stated, but the value was included with that of other by-products.

After an extended correspondence with manufacturers and others familiar with the industry, the special agent has obtained additional data which enables him to estimate that 5,637,291 pounds of glue, valued at $386,648, should be added to the preceding figures, making the total production during the census year 40,721,919 pounds, valued at $4,003,742. These figures have been carefully verified by every means which an experience of many years in the industry enabled the compiler to use.

The universal adoption of artificial methods of drying has removed from the business the principal element of uncertainty, and, while these methods add somewhat to the direct expense of manufacturing, they prevent the great waste formerly caused by bad weather. Their adoption has also had much to do with the tendency to concentrate the industry in the hands of extensive manufacturers and near large cities. The prejudice against glue making, which still exists to some extent, is largely due to conditions which have long since passed away. The competition between glue makers now compels a degree of care which removes from the industry those elements

which made it obnoxious to an adjacent population. There is nothing connected with the proper treatment of fresh hide or neat's foot stock or the boiling of fresh bones which constitutes a nuisance, but the business is often unjustly confounded with other industries which may exist in the same neighborhood.

The quantity and value of glue manufactured, as shown by the returns and the preceding estimate, are distributed in the following statement, by totals for groups of states, according to the kind of materials used:

STATEMENT INCLUDING ESTIMATED PRODUCTION AND ESTIMATED CAPITAL, ACCORDING TO KIND OF MATERIALS USED, GLUE MANUFACTURE, BY GROUPS OF STATES: 1890.

GROUPS OF STATES.	Establishments.	Total quantity. (Pounds.)	Glue made from hide, fur, or neat's-foot stock. (Pounds.)	Glue made from bone, bone liquor, or pigs' feet. (Pounds.)	Total value.	Estimated capital used in glue manufacture.
The United States	89	40,721,919	30,210,553	10,511,366	$4,003,742	$5,691,821
New England states (a)	20	6,797,206	4,976,753	1,820,453	745,137	913,213
Middle states (b)	38	18,005,842	15,540,619	2,465,223	1,732,078	2,641,666
Western states (c)	24	14,672,871	8,447,181	6,225,690	1,428,615	2,003,967
Pacific states (d)	7	1,246,000	1,246,000	.....	97,912	132,975

a Includes 20 establishments located as follows: Maine, 1; Massachusetts, 16; New Hampshire, 2; Rhode Island, 1.
b Includes 38 establishments located as follows: Maryland, 1; New York, 17; New Jersey, 6; Pennsylvania, 13; West Virginia, 1.
c Includes 24 establishments located as follows: Illinois, 5; Indiana, 3; Kentucky, 1; Michigan, 3; Minnesota, 1; Missouri, 4; Ohio, 6; Wisconsin, 1.
d Includes 7 establishments located as follows: California, 6; Oregon, 1.

The product of the 89 establishments, including estimates, is indicated by the following statement:

PRODUCT, INCLUDING ESTIMATES, BY GROUPS OF ESTABLISHMENTS: 1890.

	POUNDS.
Total	40,721,919
Quantity of glue produced in 11 establishments, each making 1,000,000 pounds or over	24,121,445
Quantity of glue produced in 10 establishments, each making 500,000 to 1,000,000 pounds	6,659,955
Quantity of glue produced in 40 establishments, each making 100,000 to 500,000 pounds	8,804,635
Quantity of glue produced in 28 establishments, each making less than 100,000 pounds	1,135,884

During the past decade 32 new establishments have engaged in the manufacture of glue, and in the census year 1890 these new establishments produced 8,007,461 pounds of glue, or 19.66 per cent of the total product, nearly three-quarters of the 8,007,461 pounds being composed of the various kinds of hide glue.

The average value of glue per pound in the United States and in the various sections of the country is shown as follows:

AVERAGE VALUE OF GLUE PER POUND AT THE FACTORY, BY GROUPS OF STATES: 1890.

GROUPS OF STATES.	All classes of glue. (Cents.)	Hide, fur, or neat's-foot glue. (Cents.)	Bone, bone liquor, or pigs' feet glue. (Cents.)
The United States	9.83	.....	.....
New England states	10.96	13.23	4.75
Middle states	9.62	10.41	4.60
Western states	9.74	.....	.....
Pacific states	7.86	7.86	.....

EMPLOYÉS AND WAGES.

The questions used at the Eleventh Census concerning employés and wages called for the average number of males, females, and children for the entire time that the establishment was in operation during the census year, by classes of (1) officers or firm members; (2) clerks; (3) operatives and skilled workmen; (4) unskilled workmen; (5) pieceworkers; also the average number employed at specified weekly rates of pay. Table 2, following this plan, presents the statistics of employés and wages as reported by the 57 establishments engaged in the manufacture of glue as a sole or principal product. In order to avoid disclosing the operations of individual establishments it is necessary in this table to present the data by groups of states.

TABLE 1.—DETAILED STATISTICS OF 57 ESTABLISHMENTS ENGAGED IN THE MANUFACTURE OF GLUE AS A SOLE OR PRINCIPAL PRODUCT, BY GROUPS OF STATES: 1890.

GROUPS OF STATES.	Number of establishments reporting.	CAPITAL.							
		Aggregate.	Value of plant.				Live assets.			
			Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
The United States	57	$4,719,741	$1,961,658	$564,275	$718,831	$678,562	$2,758,073	$644,414	$1,170,010	$943,649
New England states (a)	14	807,762	363,900	131,250	123,100	109,550	443,862	128,400	175,288	140,174
Middle states (b)	26	2,951,777	985,198	308,725	416,731	359,742	1,966,579	443,306	832,643	690,630
Western states (c)	13	856,927	534,570	201,300	159,500	173,770	322,357	72,308	152,429	97,620
Pacific states (d)	4	103,275	78,000	23,000	19,500	35,500	25,275	400	9,650	15,225

GROUPS OF STATES.	MISCELLANEOUS EXPENSES.						
	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.
The United States	$392,565	$13,450	$21,416	$33,903	$75,758	$109,928	$138,110
New England states	66,671	2,050	4,662	5,961	17,078	5,483	31,537
Middle states	267,917	8,080	13,121	19,307	42,326	96,645	88,438
Western states	50,991	2,960	3,287	8,205	14,004	7,800	14,735
Pacific states	6,986	360	346	530	2,350	.....	3,400

GROUPS OF STATES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.													
	Aggregates.		Officers, firm members, and clerks.		Operatives, skilled and unskilled.						Pieceworkers.			
			Males above 16 years.		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
The United States	1,795	$788,099	120	$121,588	1,513	$628,985	34	$8,256	67	$9,470	45	$18,200	16	$1,600
New England states	387	168,958	16	13,675	354	151,561	17	4,322	.....	.....	.....	.....	.....	.....
Middle states	1,011	446,415	78	78,223	804	338,153	7	1,434	61	8,806	45	18,200	16	1,600
Western states	361	150,797	23	27,700	322	119,933	10	2,500	6	664	.....	.....	.....	.....
Pacific states	36	21,929	3	2,590	33	19,339	.....	.....	.....	.....	.....	.....	.....	.....

GROUPS OF STATES.	COST OF MATERIALS USED.					PRODUCTS.			
	Total.	Principal materials.	Fuel.	Mill supplies.	All other materials.	Total value.	Glue.		All other products.
							Pounds.	Value.	Value.
The United States	$2,284,455	$1,916,996	$180,620	$59,591	$127,248	$2,982,781	27,442,680	$2,871,935	$1,060,846
New England states	391,864	311,981	36,214	18,227	25,442	705,438	5,696,230	644,791	60,647
Middle states	1,412,826	1,189,772	98,614	40,164	84,276	2,461,614	15,027,671	1,519,140	942,474
Western states	442,109	389,309	35,960	1,200	15,640	681,817	5,752,959	634,092	47,725
Pacific states	37,656	25,934	9,832	.....	1,890	83,912	965,920	73,912	10,000

a Includes establishments located as follows: Maine, 1; Massachusetts, 11; New Hampshire, 2.
b Includes establishments located as follows: Maryland, 1; New Jersey, 3; New York, 12; Pennsylvania, 9; West Virginia, 1.
c Includes establishments located as follows: Illinois, 1; Indiana, 3; Kentucky, 1; Michigan, 1; Missouri, 1; Ohio, 5; Wisconsin, 1.
d Includes establishments located as follows: California, 4.

TABLE 2.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT WEEKLY RATES OF PAY FOR 57 ESTABLISHMENTS ENGAGED IN THE MANUFACTURE OF GLUE AS A SOLE OR PRINCIPAL PRODUCT, BY GROUPS OF STATES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS. (a)

GROUPS OF STATES.	Number of establishments reporting.	Aggregates.		Officers or firm members actively engaged in the industry or in supervision.			Clerks.			Operatives and skilled.					
				Males above 16 years.			Males above 16 years.			Males above 16 years.			Females above 15 years.		
		Average number.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.
The United States	57	1,795	$738,099	72	$23.95	$73,885	48	$21.44	$47,703	628	$10.61	$283,868	26	$5.38	$6,510
New England states	14	387	168,958	15	19.99	12,475	1	15.38	600	211	9.94	94,885	16	4.90	4,010
Middle states	26	1,011	446,415	42	24.03	43,220	36	20.50	35,003	193	11.43	97,207	.....	.....	.....
Western states	13	361	150,797	13	28.96	16,500	10	26.11	11,200	213	10.35	84,696	10	6.41	2,500
Pacific states	4	36	21,929	2	18.14	1,690	1	18.06	900	11	13.12	7,080	.....	.....	.....

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS - continued.

GROUPS OF STATES.	Operatives and skilled—Continued.			Unskilled.									Pieceworkers.	
	Children.			Males above 16 years.			Females above 15 years.			Children.				
	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Total wages.
The United States	2	$2.23	$116	885	$8.29	$345,117	8	$5.13	$1,746	65	$2.92	$9,354	61	$19,800
New England states	.....	.....	.....	143	9.17	56,676	1	6.00	312	.....	.....	.....	.....	.....
Middle states	2	2.23	116	611	8.15	240,945	7	4.98	1,434	59	2.98	8,690	61	19,800
Western states	.....	.....	.....	109	7.37	35,237	.....	.....	.....	6	2.32	664	.....	.....
Pacific states	.....	.....	.....	22	11.12	12,259	.....	.....	.....	.....	.....	.....	.....	.....

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (b)

GROUPS OF STATES.	Average number of hours in ordinary day of labor.		Males above 16 years.								
	May to November.	November to May.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.
The United States	9.61	9.53	1,633	43	133	66	277	123	402	312	102
New England states	10.00	10.00	370	.....	12	21	40	46	134	66	23
Middle states	9.96	9.88	882	11	117	36	175	41	203	159	44
Western states	10.00	9.77	345	32	4	9	62	26	63	86	22
Pacific states	9.75	9.67	36	.....	.....	.....	.....	10	2	1	13

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

GROUPS OF STATES.	Males above 16 years—Continued.			Females above 15 years.					Children.		
	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$6 and over but under $7.	$7 and over but under $8.	$12 and over but under $15.	Total number.	Under $5.	$5 and over but under $6.
The United States	107	22	46	34	20	11	2	1	67	65	2
New England states	18	4	6	17	15	1	.....	1	.....	.....	.....
Middle states	63	8	25	7	5	.....	2	.....	61	61	.....
Western states	17	9	15	10	.....	10	.....	.....	6	4	2
Pacific states	9	1	.....	.....	.....	.....	.....	.....	.....	.....	.....

a The average weekly earnings per employé are computed from individual reports. The average number of employés reported by each establishment is multiplied by the number of weeks embraced by the term of operation; the result is the number of weeks required for 1 employé to perform the labor. Aggregating such results of individual reports, the number of weeks required for 1 employé to perform the labor is obtained. This number used as a divisor for the total wages produces the true average weekly earnings.

b In comparing the weekly rates of wages and the number of employés at each rate, with the average weekly earnings, it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés at the respective rates.

IRON AND STEEL MANUFACTURE.

IRON AND STEEL MANUFACTURE.

BY WILLIAM M. SWEET.

The branches of the iron and steel industry included in this report comprise only the operations of blast furnaces, rolling mills and steel works, iron ore forges, and pig iron and scrap iron bloomeries. The products of blast furnaces embrace pig iron, including spiegeleisen and a few castings made direct from the furnace. The products of steel works embrace all kinds of steel in the form of ingots or castings. The products of iron and steel rolling mills embrace all rolled or hammered iron and steel made by such works, and also the products of rolling mill establishments which continue the manipulation of the iron and steel until more highly finished products, such as nails and spikes, bolts, nuts, and wire, are produced, these latter articles, in some instances, constituting the principal portion of the finished products. The products of forges and bloomeries embrace blooms and hammered bar iron made directly from iron ore or from pig iron and scrap iron. In giving the tonnage of these products, and of the materials used in their manufacture, the net ton of 2,000 pounds will be used.

The period covered by this report is the year beginning July 1, 1889, and ending June 30, 1890. The subject-matter of the report is presented under 4 heads, as follows:

1. The iron and steel industry in its entirety.
2. Blast furnaces.
3. Rolling mills and steel works.
4. Iron ore forges and pig iron and scrap iron bloomeries.

The first division comprises the data pertaining to the entire industry. The statistics are subsequently shown for each of the various branches of the industry, and these branches are also considered by totals for groups of states. The following summary shows the leading statistics of the industry, by totals, for the United States, as ascertained at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, IRON AND STEEL INDUSTRY, 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880 (*b*)	1890
Number of establishments	808	792	719
Capital	$121,772,074	$209,904,965	*c*$414,044,844
Miscellaneous expenses	(*d*)	(*d*)	$18,214,948
Average number of employés (aggregates)	77,555	*e*140,798	176,506
Total wages	$40,514,981	*e*$55,451,510	$95,736,192
Officers, firm members, and clerks:			
Average number	(*f*)	(*f*)	4,325
Total wages			$6,462,236
All other employés:			
Average number	(*f*)	(*f*)	171,181
Total wages			$89,273,956
Cost of materials used	$135,526,132	$191,271,150	$327,272,845
Value of products (*g*)	$207,208,696	$296,557,685	$478,687,519
Tons of products	3,655,215	7,265,140	18,216,215

a In addition to the data shown in this statement there were reported at the census of 1880, 200 idle plants, with a capital of $18,939,963, and 13 plants in course of construction, valued at $2,126,931. At the census of 1890, 119 idle plants reported a capital of $12,369,056, and 34 plants in course of construction, valued at $4,091,678. The capital in idle works and those in course of construction was not reported separately at the census of 1870.

b For explanation of the apparent discrepancies in the data for 1870 and 1880 see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.

c Includes hired property, valued at $8,273,058. This item was not reported separately at previous censuses.

d Not reported.

e Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota, and included in the totals published at the census of 1880. These employés were engaged in making repairs to plant.

f Not reported separately.

g Includes values for which tonnage was not reported.

The following comparative statement exhibits the leading statistics for the iron and steel industry, by states and territories, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, IRON AND STEEL INDUSTRY, BY STATES AND TERRITORIES: 1880 AND 1890. (*a*)

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The United States	*b*1880	792	$209,904,965	*c*140,798	*c*$55,451,510	$191,271,150	$296,557,685
	1890	719	*d*414,044,844	*c*175,506	*c*95,736,192	327,272,845	478,687,519
Alabama	1880	8	2,757,196	1,626	571,713	601,073	1,452,856
	1890	35	17,987,583	5,878	2,522,008	7,425,344	12,544,227
California	1880	1	1,000,000	319	177,722	535,500	780,000
	1890	4	4,656,611	1,152	749,849	1,938,333	3,097,155
Colorado	1880	1	100,000	125	7,000	131,700	225,000
	*f*1890						
Connecticut	1880	17	2,557,000	685	331,184	1,341,225	1,998,698
	1890	13	2,189,521	690	418,189	1,324,078	2,037,618
Delaware	1880	8	1,341,469	867	344,476	1,214,050	2,847,177
	1890	7	2,558,865	1,690	843,219	1,549,539	2,608,670
District of Columbia	1880	1	89,600	18	7,528	2,264	10,970
	1890						
Georgia	1880	9	973,800	1,303	185,489	631,707	990,850
	1890	5	908,243	357	112,170	321,728	471,757
Illinois	1880	16	5,795,620	5,253	2,508,718	14,977,145	20,545,289
	1890	24	34,689,919	8,864	5,490,191	30,039,674	39,011,051
Indiana	1880	12	2,283,000	2,048	864,921	3,293,073	4,551,403
	1890	15	4,099,095	2,717	1,254,161	3,075,056	4,742,760
Kansas	1880	2	450,000	630	166,500	734,245	1,004,100
	1890						
Kentucky	1880	18	4,610,035	4,095	1,344,400	3,223,799	5,090,029
	1890	9	2,310,655	1,483	734,178	1,709,144	2,725,603
Maine	1880	3	450,000	700	141,494	380,511	583,328
	*f*1890						
Maryland	1880	18	4,402,125	2,763	905,090	2,888,574	4,470,050
	1890	10	4,217,574	1,272	396,351	2,217,173	2,869,208
Massachusetts	1880	24	6,163,408	6,513	2,576,539	6,657,232	10,288,921
	1890	15	9,005,555	5,337	2,652,039	6,951,018	11,201,149
Michigan	1880	15	3,342,386	3,089	922,597	3,279,420	4,591,613
	1890	19	6,696,541	1,509	896,117	4,135,991	5,829,843
Missouri	1880	12	5,698,600	3,139	734,575	3,249,558	4,660,530
	1890	9	3,495,913	1,314	720,901	2,079,254	3,237,542
Nebraska	1880	1	100,000	100	50,000	114,500	82,000
	1890						
New Hampshire	1880	2	650,000	290	127,690	523,355	807,340
	*f*1890						
New Jersey	1880	37	8,764,050	4,792	1,808,448	6,556,283	10,341,896
	1890	28	11,697,362	5,296	2,784,974	7,031,046	11,018,575
New York	1880	74	19,752,471	11,444	4,099,451	13,395,229	22,219,219
	1890	44	16,282,435	7,034	3,605,654	10,424,852	15,849,537
North Carolina	1880	9	199,400	63	7,907	11,792	41,085
	*f*1890						
Ohio	1880	103	22,807,606	20,071	8,265,070	23,997,915	34,918,360
	1890	101	37,642,887	24,166	14,126,669	44,551,301	65,206,828
Oregon	1880	1	100,000	250	46,822	33,073	78,393
	*f*1890						
Pennsylvania	1880	321	102,956,223	57,952	25,095,850	92,267,030	145,576,268
	1890	311	226,294,407	94,572	52,680,180	180,220,237	264,571,624
Rhode Island	1880	1	350,000	275	130,969	375,347	488,040
	*f*1890						
Tennessee	1880	29	2,862,826	3,077	659,773	1,376,059	2,274,203
	1890	15	4,613,355	1,557	775,521	2,943,671	4,247,868

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota and included in the totals published at the census of 1880. These employés were engaged in making repairs to plant.

d Includes hired property valued at $8,273,058. This item was not reported separately at the census of 1880.

e Includes 4,325 officers, firm members, and clerks and their wages, amounting to $6,462,236, distributed as follows: Alabama 193, $319,044; California 38, $56,549; Connecticut 41, $55,784 Delaware 53, $78,061 Georgia 18, $23,125 Illinois 179, $269,308 Indiana 69, $103,013; Kentucky 48, $63,689; Maryland 25, $34,358; Massachusetts 127, $182,964; Michigan 82, $139,756; Missouri 45, $65,802; New Jersey 146, $238,183 New York 186, $301,843; Ohio 620, $864,528; Pennsylvania 2,099, $3,129,515 Tennessee 85, $1 8,446; Virginia 100, $145,908; West Virginia 76, $103,445; Wisconsin 30, $50,754; all other states 65, $128,161. These classes were not reported separately at the census of 1880.

f See note *a* at end of table.

COMPARATIVE STATEMENT, IRON AND STEEL INDUSTRY, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
Texas	1880	1	$40,000	140	$27,720	$23,580	$36,000
	a1890						
Vermont	1880	2	320,000	191	50,035	240,900	392,300
	1890						
Virginia	1880	21	2,294,713	2,522	665,432	1,496,151	2,585,999
	1890	21	6,330,993	3,110	1,263,360	4,404,452	6,326,084
West Virginia	1880	16	3,712,616	4,121	1,541,816	3,484,625	6,054,032
	1890	12	6,458,924	3,833	1,838,209	7,906,036	10,556,865
Wisconsin	1880	8	2,768,218	2,153	1,004,931	3,830,667	6,580,391
	1890	9	6,461,531	1,920	1,032,541	4,613,753	6,501,761
Wyoming	1880	1	212,603	184	79,650	403,568	491,345
	a1890						
All other states	a1890	13	5,446,875	1,755	839,711	2,417,165	4,031,794

a Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 2; Iowa, 1; Maine, 2; Minnesota, 1; New Hampshire, 1; North Carolina, 1; Oregon, 1; Rhode Island, 1; Texas, 1; Washington, 1; Wyoming, 1.

In comparing the statistics of the Eleventh with those given at previous censuses, the following facts must be constantly borne in mind. The values reported at 1870 were expressed in a currency which was at a great discount in gold. The average premium on gold during the 12 months (June 1, 1869, to May 31, 1870) which constituted the census year was about one-fourth (25.3 per cent). A premium on gold of one-fourth is equal to a discount on currency of one-fifth. For purposes of comparison, therefore, the values of 1870 should be reduced in that ratio. The statistics for 1880 include not only the investment in blast furnace plants and machinery, and the labor directly employed in pig iron production, but also the capital and labor employed in mining and other operations conducted in direct connection with these works. Notwithstanding this fact, the cost of materials reported was apparently the cost at the furnace. There is a duplication to this extent in the cost of production, and this accounts in a measure for the inconsistencies in the figures published for the Tenth Census. In order that the census of 1890, so far as practicable, should show data relating to the manufacture of pig iron separate from other industrial operations, the statistics for that year relating to iron ore and coal mining, coke making, limestone quarrying, charcoal burning, and other similar industries dependent on the manufacture of pig iron, whether conducted in direct connection with the blast furnaces or operated independently and at remote distances, have been eliminated from the tabular statements contained in this report, these data being included in the statistics of other branches of census investigation. On the other hand, the statistics of "Live assets", such as cash, bills and accounts receivable, and similar items of capital, are believed to have been more fully reported at 1890 than at previous censuses.

The increased demands of the country for all forms of iron and steel have stimulated production during the past 20 years, while the tendency to the concentration of special branches of manufacture in large and well equipped works, and the economy brought about by the introduction of modern machinery and better furnace and mill practice have greatly reduced the selling prices of products during this period. For this reason a comparison of the aggregate tonnage of products more accurately indicates the growth in the industry than does the total value of products. From 1870 to 1880 the value of products increased from $207,208,696 to $296,557,685, or 43.12 per cent, and the tons of products from 3,655,215 to 7,265,140, or 98.76 per cent. During the decade from 1880 to 1890 the value of products increased from $296,557,685 to $478,687,519, or 61.41 per cent, while during the same period the tons of all products increased from 7,265,140 to 18,216,215, or 150.73 per cent.

COMPARATIVE PRODUCTION BY STATES.

Pennsylvania continues to be the leading iron and steel producing state in the country. In 1890 it contributed 53.02 per cent to the aggregate tonnage of all forms of iron and steel produced in that year, as compared with 49.78 per cent in 1880, and 50.25 per cent in 1870. From 1880 to 1890 it increased its production from 3,616,668 tons to 9,657,474 tons, or 167.03 per cent, while the increased output of the whole country was 150.73 per cent, or from 7,265,140 tons to 18,216,215 tons. From 1870 to 1880 the aggregate production of the whole country increased 98.76 per cent, while that of Pennsylvania increased 96.90 per cent. Ohio was the second state in production in both 1890 and 1880, increasing its production from 930,141 tons in 1880 to 2,475,532 tons in 1890, or 166.15 per cent. New York, which was third in rank in 1880, occupied fifth place in 1890, while Illinois advanced from fourth in rank in 1880 to third place in 1890. Alabama produced 6,550 tons in 1870, occupying the twentieth place in that year. In 1880 it advanced to fifteenth in rank, producing 62,986 tons, while in 1890 it was the fourth in prominence, the output in the latter year being 967,814 tons. West Virginia advanced from seventh in rank in

1880 to sixth place in 1890, while Virginia and Tennessee, which were, respectively, the sixteenth and fourteenth in rank in 1880, were seventh and eighth, respectively, in 1890. Vermont, Nebraska, and the District of Columbia have abandoned the manufacture of iron and steel since 1880. All the other States in which iron and steel were made in 1880 increased their production in 1890 except Kansas, Kentucky, Georgia, Wyoming, New York, and New Hampshire. The following statement shows the relative rank of the states and territories in 1880 and 1890, in the aggregate output of all forms of iron and steel:

COMPARATIVE STATEMENT OF PRODUCTION, STATES RANKED ACCORDING TO QUANTITY OF PRODUCT, IRON AND STEEL INDUSTRY: 1880 AND 1890.

STATES AND TERRITORIES.	RANK.		PRODUCTION.		STATES AND TERRITORIES.	RANK.		PRODUCTION.	
	1880	1890	1880	1890		1880	1890	1880	1890
			Tons.	*Tons.*				*Tons.*	*Tons.*
Total			7,255,140	18,216,215	California	21	18	14,000	56,747
					Connecticut	17	19	38,061	49,982
Pennsylvania	1	1	3,616,668	9,657,474	Colorado	27	20	4,500	33,832
Ohio	2	2	930,141	2,475,532	Georgia	18	21	35,152	30,949
Illinois	4	3	417,967	1,657,325	Maine	22	22	10,866	14,000
Alabama	15	4	62,986	967,814	Rhode Island	24	23	8,134	13,006
New York	3	5	598,300	593,712	Wyoming	23	24	9,790	9,305
West Virginia	7	6	147,487	389,207	Texas	30	25	1,400	8,950
Virginia	16	7	55,722	364,809	Oregon	28	26	3,200	8,411
Tennessee	14	8	77,100	316,540	New Hampshire	25	27	7,978	6,650
New Jersey	5	9	243,860	303,430	Washington		28		4,787
Wisconsin	6	10	178,935	289,838	North Carolina	31	29	439	3,377
Michigan	8	11	142,716	268,415	Minnesota		30		2,565
Massachusetts	9	12	141,321	159,001	Iowa		31		1,183
Missouri	10	13	125,758	128,738	Kansas	20		19,055	
Indiana	13	14	96,117	126,661	Vermont	26		6,620	
Maryland	12	15	110,934	122,178	Nebraska	29		2,000	
Kentucky	11	16	123,751	93,360	District of Columbia	32		264	
Delaware	19	17	33,918	58,437					

CAPITAL.

The aggregate capital reported for the iron and steel industry, both in active and idle establishments, and those in course of construction, including hired property, amounted to $230,971,884 in 1880 as compared with $430,505,580 reported at the census of 1890, an increase of 86.39 per cent. The following comparative statement shows the distribution of capital for the industry as reported at the censuses of 1880 and 1890.

Idle establishments embrace such establishments as were not in operation during any part of the census year, but were likely to be put in operation at some future period. Establishments that have been abandoned for iron and steel making purposes are not embraced in this report.

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, IRON AND STEEL INDUSTRY: 1880 AND 1890.

CLASSES OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock and finished products on hand, cash and bills receivable.
Total	1880	1,005	[a] $230,971,884	$122,004,227	$108,967,657
	1890	872	[b] 430,505,580	212,595,672	217,909,908
Establishments in operation	1880	792	209,904,965	112,320,428	97,584,537
	1890	719	414,044,844	200,197,208	213,847,636
Idle establishments	1880	200	18,939,988	9,094,349	9,845,639
	1890	119	12,369,058	9,185,667	3,183,391
Establishments in course of construction	1880	13	2,126,931	589,450	1,537,481
	1890	34	4,091,678	3,212,797	878,881

[a] See remarks in regard to inclusion of capital relating to mining and other operations in the figures for 1880.

[b] Includes hired property valued at $8,273,058; also hired property valued at $18,000 invested in idle establishments. This item was not reported separately at the census of 1880.

The value of land, stock in process, and finished products on hand, cash, bills receivable, unsettled ledger accounts, were not reported separately at the census of 1880, consequently in comparative statements only the totals of these items are given. The value of hired property was not reported separately at the Tenth Census, and is included in the aggregate capital for both periods.

In the following statement a similar presentation is made of the aggregate capital in each of the 3 branches of the iron and steel industry:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN DIFFERENT BRANCHES OF THE IRON AND STEEL INDUSTRY: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	BLAST FURNACES.		ROLLING MILLS AND STEEL WORKS.		FORGES AND BLOOMERIES.	
		Number of establishments.	Capital.	Number of establishments.	Capital.	Number of establishments.	Capital.
Total	1880	490	a$105,151,176	397	$121,424,745	118	$4,395,963
	1890	400	b143,633,926	440	c285,796,084	32	1,074,970
Establishments in operation	1880	341	89,531,362	358	116,458,390	93	3,915,213
	1890	304	134,608,543	395	278,559,831	20	876,470
Idle establishments	1880	142	14,394,883	33	4,064,355	25	480,750
	1890	73	6,458,865	34	5,711,693	12	198,500
Establishments in course of construction	1880	7	1,224,931	6	902,000	.....	.....
	1890	23	2,566,518	11	1,525,160	.....	.....

a See remarks in regard to inclusion of capital relating to mining and other operations in the figures for 1880.

b Includes hired property valued at $5,061,058. This item was not reported separately at the census of 1880.

c Includes hired property valued at $3,212,000; also hired property valued at $18,000 invested in idle establishments. Hired property was not reported separately at the census of 1880.

The amount of capital invested in active and idle establishments and those in course of construction in the different states and territories, with the number of establishments reported in 1880 and 1890, is given in the following statement:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, IRON AND STEEL INDUSTRY, BY STATES AND TERRITORIES: 1880 AND 1890.

STATES AND TERRITORIES.	Year	AGGREGATES.		ESTABLISHMENTS IN OPERATION.		IDLE ESTABLISHMENTS.		ESTABLISHMENTS IN COURSE OF CONSTRUCTION.	
		Number of establishments.	Capital.	Number of establishments.	Capital.	Number of establishments.	Capital.	Number of establishments.	Capital.
The United States	1880	1,005	a$230,971,884	792	$209,904,965	200	$18,939,988	13	$2,126,931
	1890	872	b430,505,580	719	414,044,844	119	12,369,058	34	4,091,678
Alabama	1880	14	3,309,196	8	2,757,196	5	399,000	1	153,000
	1890	45	19,070,976	35	17,987,583	3	297,393	7	786,000
California	1880	1	1,000,000	1	1,000,000	.....	.....	.....	.....
	1890	4	4,656,611	4	4,656,611	.....	.....	.....	.....
Colorado	1880	1	100,000	1	100,000	.....	.....	.....	.....
	c1890	.....	.....	.....	.....	.....	.....	.....	.....
Connecticut	1880	19	2,682,000	17	2,557,000	2	125,000	.....	.....
	1890	15	2,317,821	13	2,189,521	2	128,300	.....	.....
Delaware	1880	9	1,431,469	8	1,341,469	1	90,000	.....	.....
	1890	9	2,960,722	7	2,558,865	2	401,857	.....	.....
District of Columbia	1880	1	89,600	1	89,600	.....	.....	.....	.....
	1890	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	1880	14	1,135,900	9	973,800	5	162,100	.....	.....
	1890	7	991,243	5	908,243	1	43,000	1	40,000
Illinois	1880	21	6,460,620	16	5,795,620	4	490,000	1	175,000
	1890	30	35,473,169	24	34,689,919	4	513,250	2	270,000
Indiana	1880	12	2,283,000	12	2,283,000	.....	.....	.....	.....
	1890	18	4,387,095	15	4,099,095	3	288,000	.....	.....
Kansas	1880	2	450,000	2	450,000	.....	.....	.....	.....
	c1890	.....	.....	.....	.....	.....	.....	.....	.....
Kentucky	1880	29	5,493,035	18	4,610,035	11	883,000	.....	.....
	1890	15	3,044,655	9	2,310,655	4	380,000	2	354,000
Maine	1880	3	450,000	3	450,000	.....	.....	.....	.....
	c1890	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	1880	23	4,962,125	18	4,402,125	5	560,000	.....	.....
	1890	14	5,170,574	10	4,217,574	3	385,000	1	568,000

a See remarks as to inclusion of capital relating to mining and other operations in the figures for 1880.

b Includes hired property valued at $8,273,058; also hired property valued at $18,000 invested in idle establishments. This item was not reported separately at the census of 1880.

c See note a at end of table.

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, IRON AND STEEL INDUSTRY, ETC.—Continued.

STATES AND TERRITORIES.	Year.	AGGREGATES.		ESTABLISHMENTS IN OPERATION.		IDLE ESTABLISHMENTS.		ESTABLISHMENTS IN COURSE OF CONSTRUCTION.	
		Number of establishments.	Capital.	Number of establishments.	Capital.	Number of establishments.	Capital.	Number of establishments.	Capital.
Massachusetts	1880	30	$6,738,408	24	$6,163,408	6	$575,000	.....	.....
	1890	16	9,068,555	15	9,005,555	1	63,000	.....	.....
Michigan	1880	22	4,175,386	15	3,342,386	6	813,000	1	$20,000
	1890	29	7,225,241	19	6,696,541	6	373,700	4	155,000
Minnesota	1880	1	150,000	.....	.....	1	150,000	.....	.....
	a1890	.....	.....	.....	.....	.....	.....	.....	.....
Missouri	1880	22	9,152,472	12	5,698,600	8	3,104,500	2	349,372
	1890	13	5,890,428	9	3,495,913	4	2,394,515	.....	.....
Nebraska	1880	1	100,000	1	100,000	.....	.....	.....	.....
	1890	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire	1880	2	650,000	2	650,000	.....	.....	.....	.....
	a1890	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	1880	40	9,099,050	37	8,764,050	3	335,000	.....	.....
	1890	37	12,649,162	28	11,697,362	9	951,800	.....	.....
New York	1880	89	21,543,221	74	19,752,471	15	1,790,750	.....	.....
	1890	55	17,330,190	44	16,282,435	11	1,017,755	.....	.....
North Carolina	1880	20	759,400	9	199,400	11	560,000	.....	.....
	a1890	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	1880	134	25,141,294	103	22,807,606	30	2,244,688	1	89,000
	1890	118	39,927,200	101	37,642,887	16	2,197,013	1	87,300
Oregon	1880	1	100,000	1	100,000	.....	.....	.....	.....
	a1890	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania	1880	366	107,304,782	321	102,956,223	41	3,608,000	4	740,559
	1890	344	228,194,361	311	226,294,407	30	1,332,175	3	567,779
Rhode Island	1830	3	630,000	1	350,000	2	280,000	.....	.....
	a1890	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	1880	43	3,681,776	29	2,862,826	14	818,950	.....	.....
	1890	20	5,051,154	15	4,613,355	3	256,500	2	181,299
Texas	1880	1	40,000	1	40,000	.....	.....	.....	.....
	a1890	.....	.....	.....	.....	.....	.....	.....	.....
Utah	1880	3	150,000	.....	.....	2	90,000	1	60,000
	1890	.....	.....	.....	.....	.....	.....	.....	.....
Vermont	1880	4	410,000	2	320,000	2	90,000	.....	.....
	1890	.....	.....	.....	.....	.....	.....	.....	.....
Virginia	1880	44	4,329,713	21	2,294,713	22	1,535,000	1	500,000
	1890	39	7,508,093	21	6,330,993	9	253,800	9	923,300
West Virginia	1880	20	3,913,616	16	3,712,616	3	161,000	1	40,000
	1890	13	6,488,924	12	6,458,924	1	30,000	.....	.....
Wisconsin	1880	9	2,843,218	8	2,768,218	1	75,000	.....	.....
	1890	11	6,582,031	9	6,461,531	1	6,500	1	114,000
Wyoming	1880	1	212,603	1	212,603	.....	.....	.....	.....
	a1890	.....	.....	.....	.....	.....	.....	.....	.....
All other states	a1890	20	6,517,375	13	5,446,875	6	1,025,500	1	45,000

a Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 3; Iowa, 1; Kansas, 1; Maine, 2; Minnesota, 2; New Hampshire, 1; North Carolina, 1; Oregon, 1; Rhode Island, 1; Texas, 5; Washington, 1; Wyoming, 1.

The figures contained in this report furnish only a partial exhibit of the amount of capital invested in the iron and steel industries of the United States. The statistics here given are intended to exhibit, as accurately as the ramifications of the industry will permit, the actual capital directly employed in the production of crude and finished forms of iron and steel by blast furnaces, rolling mills, steel works, and forges and bloomeries. A large number of iron and steel manufacturers not only operate blast furnaces, rolling mills, and steel plants, but also control the iron ore and coal mines, coke ovens, and timber lands which supply the works with the larger part of the raw materials consumed. The census statistics for 1890 of the iron ore, coal, coke, and similar industries were embraced by other branches of census investigation, whether operated by iron and steel manufacturers or by separate concerns, and it therefore became necessary, in order to prevent duplications, to eliminate from the statistics for 1890 the data pertaining to such operations. Were the statistics of the employés in these various industries dependent either wholly or in part on the manufacture of iron and steel included in this report, the number of persons shown to be supported by our iron and steel industries would be considerably increased.

MISCELLANEOUS EXPENSES.

In the inquiry relating to the iron and steel industry at the census of 1880, no attempt was made to determine the various elements entering into the cost of manufacture, excepting the expenditure for labor and materials. The inquiry in 1890 contained questions designed to obtain information as to the entire cost of manufacture, but took no cognizance of selling and other mercantile expenses. The questions concerning miscellaneous expenses were generally answered and the data are apparently consistent when considered by individual reports and in connection with the conditions under which each particular establishment was operated, but when aggregated with similar data for other works, operated under entirely different conditions, the totals obtained are misleading. Many furnace companies in addition to manufacturing pig iron, quarry the limestone, mine the coal, manufacture the coke, and mine a large part of the iron ores consumed by them, in addition to operating a railroad in connection with some of the mines and quarries. Other concerns, while selling a large part of the pig iron they produce, manufacture a considerable portion of their crude product into more highly finished articles. While the expenditures for labor and materials in these various operations are kept as separate as if they belonged to different companies, manufacturers claimed that it was impossible to determine what part of the amount paid for taxes, interest on cash used in the business, and other sundry expenditures should be charged to each of the several branches of industry. Consequently the amounts reported for these different items by many of the establishments included not only the expenses connected with the manufacture of iron and steel, but expenses properly chargeable to classes of industry covered by other census investigations.

DEPRECIATION OF PLANT.

The interrogatory in the schedules relating to the average annual depreciation of plant was not answered by the manufacturers to a sufficient extent to obtain comprehensive results, because comparatively few establishments kept distinct accounts of the cost of labor and materials entering into the necessary repairs and additions to the works. During the last decade competition has been so active in the manufacture of iron and steel that extraordinary expenditures for remodeling old and adding new machinery and appliances have been necessary to meet the changing conditions of manufacture. Many of the blast furnaces which were in operation in 1880 have since been torn down and entirely rebuilt, with the addition of new machinery. The substitution of steel for iron has compelled rolling mill establishments to remodel their plants and add more powerful machinery of improved design.

The necessity for such changes has been so constant that it is only those establishments which have been foremost in the judicious expenditure of capital for keeping their plants fully equipped with the best appliances for manufacturing according to the most approved methods that have been able to successfully cope with the changed conditions and continue as large producers.

These remarks apply especially to the manufacture of steel rails. Establishments which were equipped with the most efficient machinery in 1880 found it necessary to entirely remodel their mills a few years later, and subsequently to replace these improvements by even more modern and economical methods of manufacture.

EMPLOYÉS AND WAGES.

The inquiry at the Eleventh Census respecting employés and wages called for the average number of males, females, and children, and the total wages paid, respectively, by classes: first, officers or firm members; second, clerks; third, operatives, engineers, and other skilled workmen, overseers, and foremen or superintendents (not general superintendents or managers); fourth, watchmen, laborers, teamsters, and other unskilled workmen. The average number of males, females, and children respectively, at specified weekly wages, was also requested, and the time the establishment was in operation, with the number of hours constituting a day's labor.

The inquiry concerning employés and wages used at the Tenth Census did not require the employés to be reported by classes.

The total number of employés reported at the census of 1890 in the branches of the iron and steel industry comprised in this report, exclusive of officers, firm members, and clerks, was 171,181, receiving $89,273,956 as wages. By dividing the number of employés into the aggregate wages there is obtained $521.52 as the average amount paid to each employé. A moment's consideration, however, will show that these figures in no respect exhibit the average yearly earnings of the employés engaged in the iron and steel industry, nor do they supply any basis upon which to determine this information. The iron and steel establishments reporting were not all in operation throughout the entire year. Some establishments did not start up until toward the close of the census year, the employés needed to operate them being drawn from other branches of industry. Many concerns, during periods when the establishments are not in operation, employ the workmen in making repairs, preparing materials for the works, or in other labor, the amount so expended, although contributing to the yearly earnings of each employé, is not charged to iron and steel manufacture, and consequently is not included in the aggregate wages. It is only by a full knowledge of the labor performed by employés during periods when they are not in demand for iron and

steel making that a showing of the average annual earnings for each person engaged in the iron and steel industry may be made.

As the statistics of employés at the blast furnaces in 1880 include not only those engaged in the manufacture of pig iron, but also in many cases the workmen employed in mining and other operations conducted in connection with these establishments, exact comparisons can not be made with the figures for 1890, which excludes the labor employed in the production of materials consumed by the furnaces. This will account for the apparent decrease in the number of employés in blast furnaces.

The following is a comparative statement of the average number of employés in the various branches of the iron and steel industry, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, AVERAGE NUMBER OF EMPLOYÉS, IRON AND STEEL INDUSTRY: 1880 AND 1890.

CLASS OF WORKS.	AVERAGE NUMBER OF EMPLOYÉS.							
	Aggregate.		Males above 16 years.		Females above 15 years.		Children.	
	1880 (a)	1890 (b)	1880 (a)	1890 (b)	1880	1890 (b)	1880	1890
Total	c140,798	175,506	c133,023	173,212	45	114	7,730	2,180
Blast furnaces	c41,695	34,483	c40,503	34,402	9	7	1,183	74
Rolling mills and steel works	96,164	140,537	89,645	138,327	33	107	6,486	2,103
Forges and bloomeries	2,939	486	2,875	483	3	.....	61	3

a In many cases the employés reported for 1880 included those at work in mines and other operations not covered by this report.

b Includes officers or firm members and clerks. These classes were not reported separately at the census of 1880.

c Does not include 180 employés reported by an idle establishment in Minnesota and included in the totals published at the census of 1880. These employés were engaged in making repairs to plant.

The following statement presents the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, IRON AND STEEL INDUSTRY: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages	Number.	Wages.	Number	Wages.	Number.	Wages.
All classes	175,506	$95,736,192	173,212	$95,273,168	114	$46,816	2,180	$416,208
Officers or firm members	1,407	3,820,848	1,407	3,820,848	.....	.....	.....	.....
Clerks	2,918	2,641,388	2,862	2,611,678	56	29,710	.....	.....
Skilled	87,049	57,995,737	86,914	57,958,147	2	1,040	133	36,550
Unskilled	84,132	31,278,219	82,029	30,882,495	56	16,066	2,047	379,658

The following statement presents the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, IRON AND STEEL INDUSTRY: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	168,943	58	2,180
Under $5	1,643	28	1,533
$5 and over but under $6	3,424	12	347
$6 and over but under $7	10,198	8	282
$7 and over but under $8	20,265	4	16
$8 and over but under $9	25,041	3	2
$9 and over but under $10	23,727	1	.....
$10 and over but under $12	24,516	2	.....
$12 and over but under $15	21,458	.....	.....
$15 and over but under $20	17,974	.....	.....
$20 and over but under $25	10,502	.....	.....
$25 and over	7,195	.....	.....

MATERIALS USED.

CONSUMPTION OF FUEL.

Of the total cost of materials used by iron and steel works in 1890, amounting to $327,272,845, the expense for fuel was $55,561,749, or 16.98 per cent, as compared with 18.81 per cent in 1880.

The following is a comparative statement of the quantity and cost of each kind of fuel used in the different branches of the iron and steel industry in 1880 and 1890:

COMPARATIVE STATEMENT, QUANTITY AND COST OF FUEL CONSUMED IN THE DIFFERENT BRANCHES OF THE IRON AND STEEL INDUSTRY: 1880 AND 1890.

KINDS OF FUEL.	Year.	AGGREGATES.		BLAST FURNACES.		ROLLING MILLS AND STEEL WORKS.		FORGES AND BLOOMERIES.	
		Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.
Total	1880	.....	$35,969,873	.....	$21,917,002	.....	$13,202,597	.....	$850,274
	1890	.....	55,561,749	.....	37,884,383	.....	17,397,434	.....	279,932
Anthracite coal.....tons..	1880	3,322,498	9,889,037	2,615,182	8,012,755	706,976	1,875,062	340	1,220
	1890	2,973,914	6,654,420	2,012,477	5,165,761	961,039	1,487,713	398	946
Bituminous coal.....tons..	1880	5,659,055	12,610,440	1,051,753	2,095,887	4,605,689	10,510,255	1,613	4,298
	1890	5,723,409	10,426,030	551,007	759,522	5,171,102	9,663,208	1,300	3,300
Coke.....tons..	1880	2,277,555	8,743,382	2,128,255	8,129,240	142,605	582,901	6,695	31,241
	1890	9,632,390	28,752,972	9,237,935	27,435,789	393,050	1,311,588	1,405	5,604
Charcoal.....bushels..	1880	69,592,091	4,726,114	53,909,828	3,679,120	2,667,902	234,379	13,014,361	812,615
	1890	74,499,202	5,037,175	67,672,156	4,523,320	2,770,611	243,773	4,056,435	270,082
Oil used for fuel.....barrels..	1880	853	900	.....	.....	.....	.....	853	900
	1890	1,859,138	1,124,206	.....	.....	1,859,138	1,124,206	.....	.....
Natural gas.....	1880	.....	.....	.....	.....	.....	.....	.....	.....
	1890	.....	3,566,946	.....	.....	.....	3,566,946	.....	.....

The aggregate consumption of iron ore, mill cinder, and fluxing material, and the total cost of these materials used in the census years 1880 and 1890, are shown in the following statement:

COMPARATIVE STATEMENT, QUANTITY AND COST OF IRON ORE, MILL CINDER, AND FLUXING MATERIAL CONSUMED IN THE DIFFERENT BRANCHES OF THE IRON AND STEEL INDUSTRY: 1880 AND 1890.

CLASS OF MATERIALS.	Year.	AGGREGATES.		BLAST FURNACES.		ROLLING MILLS AND STEEL WORKS.		FORGES AND BLOOMERIES.	
		Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.
Total	1880	11,232,905	$39,974,700	10,779,881	$36,663,281	373,414	$2,779,879	79,610	$531,540
	1890	24,332,783	74,254,942	23,732,473	70,789,216	581,503	3,355,139	18,807	110,587
Iron ore	1880	7,709,708	36,516,697	7,256,684	33,205,278	373,414	2,779,879	79,610	531,540
	1890	17,425,422	66,971,256	16,825,112	63,505,530	581,503	3,355,139	18,807	110,587
Mill cinder	1880	354,048	910,667	354,048	910,667	.....	.....	.....	.....
	1890	1,283,071	3,086,808	1,283,071	3,086,808	.....	.....	.....	.....
Fluxing material	1880	3,169,149	2,547,336	3,169,149	2,547,336	.....	.....	.....	.....
	1890	5,624,290	4,196,878	5,624,290	4,196,878	.....	.....	.....	.....

OTHER MATERIALS.

The materials not mentioned in the preceding statements consist of different forms of iron and steel, and the following comparative statement gives the tonnage of this class of materials consumed in the iron and steel industry during the census years 1880 and 1890. The old or scrap material presented in this table includes only the old or waste materials purchased and consumed by the iron and steel works and takes no account of the scrap iron and scrap steel which are the constant product of rolling mills and steel works, and usually consumed by the works producing them.

COMPARATIVE STATEMENT, QUANTITY AND COST OF IRON AND STEEL USED AS MATERIAL, IRON AND STEEL INDUSTRY: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Tons.	Cost.	Tons.	Cost.
Aggregate	4,268,643	$113,424,247	9,784,052	$179,288,771
Old and scrap iron and steel (total)	1,351,636	37,908,350	1,957,301	36,460,815
Old iron rails	708,534	20,701,099	392,495	9,109,765
Other old or scrap iron	447,078	11,768,274	967,623	16,778,388
Old steel rails and steel rail ends	85,653	2,435,263	145,837	2,627,649
Other old or scrap steel	110,371	3,003,714	451,346	7,945,013
All other materials (total)	2,917,007	75,515,897	7,826,751	142,827,956
Spiegeleisen and ferro manganese	86,138	2,868,519	248,536	7,588,784
Pig iron	2,596,635	59,945,632	6,308,226	97,903,934
Hammered iron ore blooms	43,411	2,588,140	16,936	599,983
Hammered pig and scrap blooms	49,511	2,549,829	23,452	720,457
Purchased muck bar	53,754	2,369,544	234,678	6,252,594
Purchased bessemer steel	a52,155	2,808,497	838,118	24,117,921
Purchased open-hearth steel	a24,993	1,530,560	141,342	4,635,585
Swedish billets and bars	10,410	855,176	15,463	1,008,698

a Sixteen thousand four hundred and ninety-six tons of "Other billets and bars" costing $908,407, shown separately under classified materials in report for 1880, for comparative purposes are distributed as follows: 9,216 tons, $507,509, with purchased bessemer steel, and 7,280 tons, $400,898, with purchased open-hearth steel.

No section of the United States contains all the raw materials essential to the development of an extensive iron and steel industry. The southern states are endowed with a wealth of iron ore, coal, and limestone deposits in close proximity to each other, which permits the manufacture of pig iron at a cost considerably below that possible in other sections. This pig iron, however, is unsuitable for the manufacture of steel by the process most largely in use at the present time. Michigan and Wisconsin, although containing immense deposits of high grade ores for steel making purposes, have no mineral fuel economically available for iron making purposes, and in parts of these states there is a deficiency in the supply of wood for charcoal. Pennsylvania is rich in both anthracite and bituminous coal, but the iron ores with few exceptions carry only small percentages of iron and are suitable only for foundry and mill purposes. The wide separation of the materials for iron manufacture in the northern states necessitates the transportation of the ore and fuel long distances. The iron ore from Lake Superior is carried a distance of over 1,000 miles to the furnaces in central Pennsylvania, while the coke from the Connellsville region in Pennsylvania is used in the furnaces as far west as Chicago. The payment of freight on the various raw materials constitutes an important item in the cost of iron and steel manufacture.

PRODUCTION OF IRON AND STEEL.

The following is a comparative statement of the aggregate tonnage of iron and steel products in 1880 and 1890, with the percentages of increase or decrease in each class:

COMPARATIVE STATEMENT, CLASS, QUANTITY, AND PERCENTAGE OF INCREASE OR DECREASE OF PRODUCTS, IRON AND STEEL INDUSTRY: 1880 AND 1890.

CLASS OF PRODUCTS.	TONS.		PERCENTAGE OF INCREASE OR DECREASE.	
	1880	1890	Increase.	Decrease.
Total	7,265,140	18,216,215	150.73	
Pig iron, including castings direct from furnace	3,781,021	9,906,607	162.01	
Rolled and hammered products and direct steel castings:				
Iron	2,353,248	3,225,140	37.05	
Bessemer steel	889,896	4,385,365	392.80	
Open-hearth steel	93,143	590,198	533.65	
Crucible steel	70,319	69,903		0.59
Miscellaneous steel	4,956	4,227		14.71
Products of forges and bloomeries	72,557	34,775		52.07

The counties showing the greatest production of iron and steel during the census year 1890, compared with the same counties for 1880, are presented in the following statement. These counties are divided into two classes, arranged in order of largest production in 1890. In one class are included those which produced in 1890 over

100,000 tons of pig iron and finished forms of iron and steel: the second class includes all counties producing over 60,000 tons, but less than 100,000 tons in 1890. In the first list are 31 counties, representing 8 states, and in the second list 19 counties, representing 11 states.

COMPARATIVE STATEMENT, PRODUCTION OF IRON AND STEEL, COUNTIES PRODUCING 60,000 TONS AND OVER IN 1890: 1880 AND 1890.

COUNTIES PRODUCING OVER 100,000 TONS OF PIG IRON, ROLLED AND HAMMERED IRON AND STEEL, AND BLOOMS.

COUNTIES.	NET TONS.		COUNTIES.	NET TONS.	
	1880	1890		1880	1890
Allegheny, Pa	848,146	3,796,048	Lawrence, Pa	88,443	262,315
Cook, Ill	248,479	1,154,259	Trumbull, Ohio	73,339	247,165
Jefferson, Ala	26,052	684,055	Marshall, W. Va	37,700	206,417
Mahoning, Ohio	219,957	626,282	Belmont, Ohio	56,193	181,876
Dauphin, Pa	223,676	573,853	Milwaukee, Wis	128,191	174,678
Cambria, Pa	260,140	570,330	Ohio, W. Va	84,767	174,305
Cuyahoga, Ohio	210,354	554,847	Rensselaer, N. Y	177,967	172,135
Lackawanna, Pa	151,273	550,132	Chester, Pa	78,363	150,886
Northampton, Pa	322,882	500,487	Lancaster, Pa	87,019	127,811
Mercer, Pa	182,881	493,022	Montour, Pa	79,789	121,455
Lehigh, Pa	324,875	411,187	Wayne, Mich	63,548	115,167
Lebanon, Pa	73,149	403,130	Albany, N. Y	40,611	111,150
Will, Ill	84,094	369,275	Columbiana, Ohio	44,110	105,773
Montgomery, Pa	168,628	340,874	Delaware, Pa	9,988	104,149
Berks, Pa	213,580	335,503	Fayette, Pa	37,108	100,638
Jefferson, Ohio	40,561	292,871			

COUNTIES PRODUCING OVER 60,000 BUT UNDER 100,000 TONS OF PIG IRON, ROLLED AND HAMMERED IRON AND STEEL, AND BLOOMS.

COUNTIES.	NET TONS.		COUNTIES.	NET TONS.	
	1880	1890		1880	1890
Worcester, Mass	30,180	98,492	Blair, Pa	68,039	71,013
Warren, N. J	76,622	97,595	Marion, Tenn	17,958	70,795
Lawrence, Ohio	70,794	95,444	Roanoke, Va		69,916
Baltimore city and Baltimore county, Md	69,944	94,581	Hamilton, Tenn	35,645	67,907
Colbert, Ala		92,395	St. Clair, Ill	26,650	67,794
St. Louis city and St. Louis county, Mo	102,644	91,252	Rhea, Tenn		64,453
Armstrong, Pa	9,300	88,069	Perry, Ohio	34,834	63,259
Philadelphia, Pa	65,983	82,094	Oneida, N. Y	21,108	61,785
Alleghany, Va	8,437	80,423	Center, Pa	17,411	61,628
Essex, N. Y	66,725	73,699			

In the compilation of the statistics relating to the manufacture of iron and steel there is a partial duplication of some of the items that contribute to the aggregate tonnage and value of all products. In a number of instances the finished product of one establishment becomes the raw material of another, and after further manipulation appears again in the table of products. This duplication is unavoidable. The finished products of each individual establishment must be considered to comprise the various articles produced and sold by it, whether the articles are of the most highly finished character or are only suitable for remanufacture by the establishment purchasing them. Thus, "muck bar produced for sale" and steel sold by the bessemer and open-hearth steel works to other rolling mill establishments in the form of billets or slabs are unavoidable duplications, as these materials appear a second time as bars, plates, or other articles as the finished products of the establishments purchasing the crude metal.

Similar methods of tabulation were necessarily employed in presenting the results of previous censuses, so that accuracy of comparison of tonnages and values at different periods is not invalidated.

MACHINERY.

The following statement gives the number, equipment, and capacity of the iron and steel works in the United States, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, NUMBER, EQUIPMENT, AND CAPACITY OF ESTABLISHMENTS, IRON AND STEEL INDUSTRY: 1880 AND 1890.

[Including idle establishments.]

ITEMS.	1880	1890
Blast furnaces:		
Number of establishments	483	377
Number of completed furnaces	681	559
Total daily capacity in tons of pig iron	19,248	42,436
Rolling mills and steel works:		
Number of establishments	391	429
Total daily capacity in net tons of finished products	22,098	46,565
Number of single puddling furnaces, each double furnace counted as 2 single furnaces.	4,376	4,853
Number of heating furnaces	2,622	2,912
Number of hammers	458	625
Number of cut-nail machines	3,775	5,909
Number of trains of rolls	1,342	1,557
Number of bessemer steel converters (including Clapp-Griffiths and Robert-Bessemer).	24	97
Total daily capacity in tons of ingots	4,467	21,599
Number of open-hearth steel furnaces	37	129
Total daily capacity in tons of ingots	827	4,041
Number of pots which can be used at each heat in crucible steel works	2,091	2,666
Forges and bloomeries:		
Number of establishments	118	32
Number of fires	495	202
Number of hammers	141	39
Total daily capacity in tons of blooms, billets, or bars	520	295

At the census of 1890 the whole number of establishments reported, including those that were idle and in course of construction, was 872, as compared with 1,005 in 1880 and 808 in 1870. The decrease in the number of establishments from 1880 to 1890 is due largely to the decline in the manufacture of blooms and hammered bar iron direct from iron ore and from pig and scrap iron in forges and bloomeries, to the dismantling of many of the smaller blast furnace plants, to the erection of fewer but larger works, and to the many consolidations of existing establishments under one management which have taken place since 1880. The 483 blast furnace establishments in 1880, controlling 681 furnaces, had a total daily capacity of 19,248 tons of pig iron, while the 377 establishments in 1890, with only 559 furnaces, reported a total daily capacity of 42,436 tons. There is an increase in both the number and the capacity of establishments engaged in the manufacture of crude steel and of finished forms of iron and steel, the great expansion in the capacity being largely caused by improvements in machinery and methods of manufacture, the more general substitution of steel for iron, and greater rapidity in the working of plant.

MANUFACTURE OF PIG IRON—BLAST FURNACES.

The production of pig iron in the United States during the census year 1890 amounted to 9,906,607 tons of 2,000 pounds, as compared with an output of 3,781,021 tons in 1880, and 2,052,821 tons in 1870. From 1870 to 1880 the increase in production amounted to 1,728,200 tons, or 84.19 per cent, while from 1880 to 1890 the increase was 6,125,586 tons, or 162.01 per cent.

The following comparative summary indicates the growth of the pig iron industry since 1870:

COMPARATIVE SUMMARY, BLAST FURNACES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880 (*b*)	1890
Number of establishments	386	341	304
Capital	$56,145,326	$89,531,362	*c*$134,608,543
Miscellaneous expenses	(*d*)	(*d*)	$6,342,675
Average number of employés (aggregate)	27,554	*e*41,695	34,483
Total wages	$12,475,250	*e*$12,655,428	$16,226,145
Officers, firm members, and clerks:			
Average number	(*f*)	(*f*)	1,068
Total wages			$1,611,687
All other employés:			
Average number	(*f*)	(*f*)	33,415
Total wages			$14,614,458
Cost of materials used	$45,498,017	$58,619,742	$110,098,615
Value of products	$69,640,498	*g*$89,315,569	*g*$145,643,153
Tons of products	2,052,821	3,781,021	9,906,607

a This statement includes only active establishments for the censuses of 1880 and 1890; such establishments were not reported separately at the census of 1870.

b For explanation of the apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870, also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.

c Includes hired property valued at $5,061,058. This item was not reported separately at previous censuses.

d Not reported.

e Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota, and included in the totals published for the census of 1880. These employés were engaged in making repairs to plant.

f Not reported separately.

g Includes values for which tonnage was not reported.

The following comparative statement exhibits the leading statistics of the blast furnace industry, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, BLAST FURNACES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The United States	*b*1880	341	$89,531,362	*c*41,695	*c*$12,655,428	$58,619,742	$89,315,569
	1890	304	*d*134,608,543	*e*24,483	*e*16,226,145	110,098,615	145,643,153
Alabama	1880	7	2,707,196	1,566	553,713	575,673	1,405,356
	1890	28	15,778,786	4,139	1,783,700	6,493,884	10,315,091
Connecticut	1880	6	1,172,000	139	65,974	471,467	644,911
	1890	5	940,092	129	66,881	412,743	574,438
Georgia	1880	5	712,000	754	77,415	241,796	466,890
	1890	4	748,845	269	64,676	237,836	339,422
Illinois	1880	3	950,000	498	185,054	1,762,609	2,391,850
	1890	5	9,855,274	1,431	919,145	8,068,153	10,138,310
Indiana	1880	3	455,000	308	54,840	335,606	460,535
	*f*1890						
Kentucky	1880	9	2,098,035	1,890	429,988	801,410	1,248,652
	1890	4	826,199	278	105,520	461,608	665,763
Maine	1880	1	150,000	300	44,950	23,569	60,375
	*f*1890						

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880 see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota and included in the totals published for the census of 1880. These employés were engaged in making repairs to plant.

d Includes hired property valued at $5,061,058. This item was not reported separately at the census of 1880.

e Includes 1,068 officers, firm members, and clerks and their wages, amounting to $1,611,687, distributed as follows: Alabama 150, $262,396; Connecticut 12 $16 247; Georgia 15, $19,175; Illinois 11, $23,115; Kentucky 16, $17,038; Maryland 9, $7,530; Michigan 57, $95,312; Missouri 27, $37,763; New Jersey 15, $22,386; New York 52, $91,181; Ohio 107, $200,890; Pennsylvania 355, $561,407; Tennessee 64, $87,616; Virginia 60, $80,207; West Virginia 13, $16,758, Wisconsin 16, $30,154; all other states 29, $42,512. These classes were not reported separately at the census of 1880.

f See note *a* at end of table.

COMPARATIVE STATEMENT, BLAST FURNACES, BY STATES: 1880 AND 1890—Continued.

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
Maryland	1880	12	$2,197,125	1,443	$339,978	$956,806	$1,700,339
	1890	5	3,108,222	639	151,342	1,316,539	1,632,004
Massachusetts	1880	2	632,000	390	176,000	169,026	312,810
	a1890						
Michigan	1880	13	2,671,386	2,164	561,870	2,091,224	3,145,062
	1890	15	5,259,001	732	416,334	2,935,233	3,982,278
Missouri	1880	4	2,450,000	1,185	227,111	1,685,124	2,275,017
	1890	5	1,883,470	654	298,966	1,247,688	1,716,983
New Jersey	1880	12	$3,644,500	1,174	$365,639	$2,488,670	$3,428,747
	1890	8	3,131,366	655	262,538	1,679,937	2,228,724
New York	1880	30	8,836,471	2,518	902,929	4,166,622	6,816,241
	1890	16	6,443,208	1,462	672,288	4,212,888	5,182,606
Ohio	1880	62	13,002,586	8,944	2,725,157	9,149,620	13,038,193
	1890	46	11,750,497	4,224	2,057,127	15,696,665	19,800,268
Oregon	1880		100,000	250	46,822	33,073	78,393
	a1890						
Pennsylvania	1880	137	41,488,294	13,460	4,752,838	29,675,075	45,572,750
	1890	116	59,321,570	15,967	7,645,715	57,222,481	75,239,203
Tennessee	1880	9	1,422,626	1,579	261,897	489,440	840,022
	1890	11	3,685,806	1,076	525,992	2,450,882	3,366,464
Texas	1880	1	40,000	140	27,720	23,580	36,000
	a1890						
Vermont	1880	1	20,000	26	2,035	13,800	24,800
	1890						
Virginia	1880	8	1,391,500	1,221	255,986	205,548	440,695
	1890	15	4,156,206	1,328	558,312	2,820,167	3,925,481
West Virginia	1880	8	1,322,425	893	240,158	1,158,611	1,631,096
	1890	4	1,446,082	424	198,933	1,503,847	2,009,505
Wisconsin	1880	7	2,068,218	853	357,354	2,101,393	3,295,835
	1890	8	3,546,340	611	307,041	2,378,006	3,114,892
All other states	a1890	9	2,727,579	465	191,635	940,058	1,411,121

a Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 1; Indiana, 2; Maine, 1; Massachusetts, 1; North Carolina, 1; Oregon, 1; Texas, 1; Washington, 1.

In 1880 blast furnaces were located in 24 states and 1 territory, but pig iron was produced in only 22 states, the furnaces in Minnesota, North Carolina, and Utah territory being idle in that year. In the census year 1890 there were 25 states that contained completed blast furnaces, and pig iron was made in that year in each of these states except Minnesota. Since 1880 the manufacture of pig iron has been abandoned in Vermont and Utah, and during the same period 2 states, namely, Colorado and Washington, have engaged in its production. California does not appear among the pig iron producing states in either 1880 or 1890. A charcoal furnace was completed and put in operation in that state in 1881, but it has made no pig iron since 1886, and is practically abandoned.

The relative rank of the various states has undergone many changes since 1880. Pennsylvania still retains its leadership as the producer of pig iron, being credited with 51.05 per cent of the total production in 1880 and 49.13 per cent in 1890. Ohio was second in rank in both 1880 and 1890, the output of pig iron in this state in the former year being 14.51 per cent of the total production, and in the latter year 13.60 per cent. Alabama, which occupied tenth place in 1880, now occupies third place, the production of this state in 1890 amounting to 915,609 tons, as compared with 62,336 tons in 1880. Illinois, which was seventh in rank in 1880, is fourth in 1890, and New York, which was third in rank in 1880, occupies fifth place in 1890. Virginia, which was seventeenth in rank in 1880, is now sixth, while Tennessee has advanced from the thirteenth to the seventh place.

CAPITAL.

The aggregate capital reported for this branch of the iron and steel industry, including active and idle establishments and those in course of construction, was $105,151,176 at the census of 1880, as compared with $143,633,926 at the census of 1890, an increase of $38,482,750, or 36.60 per cent.

The comparative statement on the following page shows the distribution of capital in active and idle establishments and those in course of construction in the blast furnace industry as reported at the censuses of 1880 and 1890.

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, BLAST FURNACES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL. Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash, and bills receivable.
Total	1880	490	a $105,151,176	$48,000,081	$57,151,095
	1890	400	b 143,633,926	77,989,695	65,644,231
Establishments in operation	1880	341	89,531,362	41,268,481	48,262,881
	1890	304	134,608,543	71,236,048	63,372,495
Idle establishments	1880	142	14,394,883	6,277,150	8,117,733
	1890	73	6,458,865	4,695,150	1,763,715
Establishments in course of construction	1880	7	1,224,931	454,450	770,481
	1890	23	2,566,518	2,058,497	508,021

a See remarks in regard to the inclusion of capital relating to mining and other operations in the figures for 1880.
b Includes hired property valued at $5,061,058. This item was not reported separately at the census of 1880.

As the item of "Buildings, machinery, tools, and implements" more accurately represents the direct investment in the blast furnace industry common to the two periods than does the item of land and cash assets, the figures presented for both years for the first item may be taken as a fairly true index of the growth of this branch of manufacture since 1880. The increase in the total capital invested was 36.60 per cent, while the investment in buildings and machinery has increased 62.48 per cent, and the land and cash and stock on hand 14.86 per cent. The value of land was not reported separately in 1880. Statements accompanying this report present in detail the statistics concerning capital in the blast furnaces of the different states as reported at the Eleventh Census.

EMPLOYÉS AND WAGES.

The following statement presents the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES, BY CLASSES, BLAST FURNACES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	34,483	$16,226,145	34,402	$16,209,335	7	$3,010	74	$13,800
Officers or firm members	506	1,174,212	506	1,174,212	.....	.....	.....	.....
Clerks	562	437,475	555	434,465	7	3,010	.....	.....
Skilled	9,094	5,261,191	9,094	5,261,191	.....	.....	.....	.....
Unskilled	24,321	9,353,267	24,247	9,339,467	.....	.....	74	13,800

The following statement presents the average number of employés at the different weekly rates of wages

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, BLAST FURNACES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS. Males above 16 years.	Children.
Total	33,341	74
Under $5	235	46
$5 and over but under $6	269	28
$6 and over but under $7	2,163	.....
$7 and over but under $8	4,867	.....
$8 and over but under $9	5,613	.....
$9 and over but under $10	6,351	.....
$10 and over but under $12	6,576	.....
$12 and over but under $15	4,722	.....
$15 and over but under $20	1,759	.....
$20 and over but under $25	541	.....
$25 and over	245	.....

During the census year 1890 the blast furnace establishments were in operation an average of 9.23 months each, and the average term of employment for labor was 10.62 months, the excess of the latter period over the former being due to the fact that establishments reporting the maximum term of operation also reported the greatest number of hands. In 1880 the blast furnace establishments were in operation an average of 8 months.

MATERIALS USED.

The total quantity and cost of each class of materials consumed by the blast furnaces as reported at the censuses of 1880 and 1890, with the aggregate cost of all materials, is shown in the following statement. With the exception of charcoal, which is reported in bushels, the quantities are given in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, BLAST FURNACES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Cost.	Quantity.	Cost.
Total	.....	$58,619,742	.....	$110,098,615
Domestic iron ore	7,256,684	33,205,278	15,734,400	57,607,945
Foreign iron ore	(a)	.....	1,090,712	5,897,585
Fluxing material	3,169,149	2,547,336	5,624,290	4,196,878
Anthracite coal	2,615,182	8,012,755	2,012,477	5,165,761
Bituminous coal	1,051,753	2,095,887	551,007	759,522
Coke	2,128,255	8,129,240	9,237,935	27,435,780
Charcoal	53,909,828	3,679,120	67,672,156	4,523,320
Mill cinder and scrap	354,048	910,667	1,283,071	3,086,808
All other materials	.....	39,459	.....	1,425,016

a Domestic and foreign iron ore were not reported separately at the census of 1880.

The foreign iron ores consumed in 1890 were obtained almost wholly from Cuba, Spain, Algiers, and Elba, a small quantity being imported from Canada. The consumption of foreign iron ores has been increasing in recent years, the purity of the material, its adaptability for steel making purposes, and its relatively low cost commending it to the blast furnace establishments along the Atlantic seaboard, in Maryland, Pennsylvania, New Jersey, and New York.

RICHNESS OF IRON ORES.

In addition to 15,734,400 tons of domestic iron ore and 1,090,712 tons of foreign iron ore consumed by blast furnaces in 1890 there were smelted for iron making purposes 1,283,071 tons of the waste materials of other industrial operations. These waste materials included mill cinder and roll and hammer scale obtained in the puddling, heating, and rolling of iron; residuum from the smelting of franklinite in the production of zinc, which was employed by 2 furnaces in New Jersey, and 1 in Pennsylvania in the production of spiegeleisen; and blue billy, or purple ore, a product of the manufacture of sulphuric acid from iron pyrites. The aggregate consumption of iron ore and these waste materials in 1890 was 18,108,183 tons, producing 9,906,607 tons of pig iron, while in 1880 the total output of pig iron was 3,781,021 tons, with a consumption of iron ore and other materials used as iron ore of 7,610,732 tons. Considering that the average yield of metal in the blast furnaces from foreign iron ore, mill cinder, rolling mill scale, zinc residuum, etc., is 57 per cent, as estimated by Mr. John Birkinbine, special agent in charge of the investigation on the mining of iron ore in 1890, there was obtained an output of pig iron from this source in 1890 of 1,353,056 tons. This leaves 8,553,551 tons of pig iron as the approximate quantity produced from the 15,734,400 tons of domestic iron ore in 1890, or an average yield of metal from ores mined in the United States of 54.36 per cent. No statistics are available of the consumption of foreign iron ores by the blast furnaces in the census year 1880, but assuming the 416,174 tons imported in that year to have entered into consumption during that period, there remains a total of 6,840,510 tons as the quantity of domestic iron ore smelted in 1880. Assuming that the foreign iron ore, mill cinder, etc., consumed in 1880 yielded 439,027 tons of pig iron, we have 3,341,994 tons as the quantity of pig iron produced from the 6,840,510 tons of domestic iron ore consumed, or an average yield of metal to the ton of ore of 48.86 per cent. The increased yield in 1890 over 1880 is largely due to the more general employment of the rich ores of the Lake Superior region as a substitute for the leaner local ores consumed in 1880 by many northern and western blast furnaces.

PRODUCTS.

Aggregate figures such as are obtained in the tabulation of the individual reports for a number of establishments in any particular district supply no accurate data to determine the cost of producing a given manufactured article. Even at 2 furnaces situated in the same locality, employing the same number of men, and consuming the same character of materials, the cost of production may vary as much as $2 to $3 a ton. At 1 establishment the cost of the ore, limestone, and coal used is calculated according to the expense incurred in mining and assembling these materials at the furnace, while the other concern, although owning and operating its own mines, may charge the material to the furnace at the market price. In the first instance the cost of producing a ton of pig iron is considerably below the cost at the second works, where the materials charged into the furnace already carry a profit for the mining operations, which element is not included in the cost reported for the other plant.

The following comparative statement shows the total tonnage production of pig iron in 1880 and 1890 classified according to the fuel used, with the proportion each kind bears to the aggregate output in the 2 years. The figures include the quantity of spiegeleisen and castings made direct from the furnace.

COMPARATIVE STATEMENT, PRODUCTION OF PIG IRON, INCLUDING DIRECT CASTINGS, CLASSIFIED ACCORDING TO KIND OF FUEL USED, WITH PERCENTAGE EACH CLASS IS OF TOTAL, BLAST FURNACES: 1880 AND 1890.

CLASS OF PRODUCTS.	TONS.		PERCENTAGE OF TOTAL PRODUCTION.	
	1880	1890	1880	1890
Total	a3,781,021	9,906,607	100.00	100.00
Mixed anthracite coal and coke pig iron	714,590	1,893,241	18.90	19.11
Coke and bituminous coal pig iron	1,517,553	7,017,769	40.14	70.84
Charcoal pig iron	435,318	664,711	11.51	6.71
Anthracite coal pig iron	1,113,560	330,886	29.45	3.34

a Four thousand two hundred and twenty-nine tons of direct castings shown in the report for blast furnaces, 1880, have been distributed in this statement among the several kinds of pig iron; hence the quantities of pig iron do not agree with the data shown in the report for the Tenth Census.

The production of spiegeleisen in the census year 1890, which is included in the figures of total production of pig iron, amounted to 133,704 tons, as compared with 12,875 tons produced in the census year 1880. Four states made spiegeleisen in 1890, namely, New Jersey, Pennsylvania, Illinois, and Colorado, while in 1880 only New Jersey and Pennsylvania were engaged in its manufacture. The production of castings direct from the furnace amounted to 6,066 tons in 1890 and 4,229 tons in 1880.

The following comparative statement shows the quantity and value of pig iron produced in the United States in 1880 and 1890, classified according to fuel used. The figures include the quantity and value of spiegeleisen and castings made direct from the furnace.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF PRODUCTS, CLASSIFIED ACCORDING TO KIND OF FUEL USED, BLAST FURNACES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Tons.	Value.	Tons.	Value.
Total		$89,315,569		$145,643,153
Mixed anthracite coal and coke pig iron	714,590	16,627,291	1,893,241	28,195,996
Coke and bituminous coal pig iron	1,517,553	35,513,233	7,017,769	100,687,256
Charcoal pig iron	435,318	12,488,744	664,711	11,957,710
Anthracite coal pig iron	1,113,560	23,574,742	330,886	4,772,021
Total tonnage and value	a3,781,021	88,204,010	9,906,607	145,612,983
All other products		1,111,559		30,170

a Four thousand two hundred and twenty-nine tons of direct castings shown in the report for blast furnaces, 1880, have been distributed in this statement among the several kinds of pig iron; hence the quantities of pig iron do not agree with the data shown in the report for the Tenth Census.

MACHINERY.

The following statement gives the production of pig iron in the different states in tons of 2,000 pounds, including castings made direct from the furnace, during the census years 1880 and 1890, with the number of completed furnace stacks at the close of each year, and the relative rank of each state, in quantity of product and its percentage of the total production:

COMPARATIVE STATEMENT, NUMBER OF STACKS AND PRODUCTION, INCLUDING ACTIVE AND IDLE ESTABLISHMENTS, STATES RANKED ACCORDING TO QUANTITY OF PRODUCT, BLAST FURNACES: 1880 AND 1890.

STATES.	Year.	Completed furnace stacks.	Production of pig iron in tons.	Percentage of total production.	Rank.
Total	1880	681	a3,781,021	100.00	
	1890	559	b9,906,607	100.00	
Pennsylvania	1880	269	1,930,311	51.05	1
	1890	221	4,867,504	49.13	1
Ohio	1880	103	548,712	14.51	2
	1890	71	1,347,519	13.60	2
Alabama	1880	15	62,336	1.65	10
	1890	48	915,609	9.24	3
Illinois	1880	10	95,468	2.53	7
	1890	15	746,677	7.54	4
New York	1880	57	313,368	8.29	3
	1890	37	344,339	3.48	5
Virginia	1880	31	17,906	0.47	17
	1890	31	312,367	3.15	6
Tennessee	1880	21	47,873	1.27	13
	1890	19	295,889	2.99	7
Michigan	1880	27	119,586	3.16	5
	1890	26	227,827	2.30	8
Wisconsin	1880	14	118,282	3.13	6
	1890	10	215,143	2.17	9
New Jersey	1880	20	157,414	4.16	4
	1890	18	145,040	1.46	10
West Virginia	1880	11	80,050	2.12	9
	1890	5	129,369	1.31	11
Missouri	1880	17	95,050	2.51	8
	1890	8	101,030	1.02	12
Maryland	1880	22	59,664	1.58	11
	1890	14	96,636	0.98	13
Kentucky	1880	22	58,108	1.54	12
	1890	6	44,278	0.45	14
Georgia	1880	10	23,099	0.61	14
	1890	5	28,111	0.28	15
Connecticut	1880	8	18,779	0.50	15
	1890	9	22,255	0.22	16
Indiana	1880	4	18,237	0.48	16
	1890	2	16,460	0.17	17
Colorado	1880				
	1890	2	12,949	0.13	18
Texas	1880	1	1,400	0.04	21
	1890	3	8,950	0.09	19
Oregon	1880	1	3,200	0.08	19
	1890	1	8,411	0.09	20
Massachusetts	1880	6	9,543	0.25	18
	1890	4	8,380	0.08	21
Washington	1880				
	1890	1	4,787	0.05	22
Maine	1880	1	2,015	0.05	20
	1890	1	3,700	0.04	23
North Carolina	1880	7			
	1890	1	3,377	0.03	24
Minnesota	1880	1			
	1890	1			
Vermont	1880	1	620	0.02	22
	1890				
Utah	1880	2			
	1890				

a Includes 4,229 tons of castings made direct from furnace.

b Includes 6,066 tons of castings made direct from furnace.

Notwithstanding the fact that the production of pig iron has increased from 3,781,021 tons of 2,000 pounds in 1880 to 9,906,607 tons in 1890, the total number of completed furnaces has decreased during the 10 years from 681 to 559. Many furnaces which were active in 1880 have since been abandoned, owing to their inability to compete profitably with the larger, better located, and more modern furnaces. The majority of these abandoned furnaces were of small capacity, and were able to produce and market pig iron only during periods of great demand and consequent high prices. The large number of improved furnaces which have been built during recent years favorably located for the supply of materials at low cost, and within easy access to a market for the finished products, has rendered the operations of these older furnaces unremunerative even in periods of great activity.

Pennsylvania shows a decrease of 48 furnaces from 1880 to 1890, and during the same period the total number of furnaces in Ohio has decreased by 32. These figures merely exhibit the net decrease in the number of furnaces, as many large furnaces have been erected during this period in these, as well as in other states, to take the place of small stacks abandoned. Since 1880 286 furnaces have been abandoned in the United States, either owing to unfavorable location or to give place to larger and more modern plants, while during the same period 164 new furnaces have been built, in addition to a large number of plants that have been remodeled and supplied with new machinery.

The following comparative statement presents by states the number, class, and daily capacity of blast furnaces, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, NUMBER, CLASS, AND CAPACITY OF BLAST FURNACE STACKS, INCLUDING ACTIVE AND IDLE ESTABLISHMENTS, BY STATES: 1880 AND 1890.

STATES.	Year.	Total number of completed furnacestacks.	Total daily capacity in tons of 2,000 pounds.	CHARCOAL FURNACES.		ANTHRACITE AND MIXED ANTHRACITE AND COKE FURNACES.		COKE AND BITUMINOUS COAL FURNACES.	
				Number of stacks.	Daily capacity in tons.	Number of stacks.	Daily capacity in tons.	Number of stacks.	Daily capacity in tons.
The United States	1880	681	19,248	251	3,306	231	7,572	199	8,370
	1890	559	42,436	140	3,783	170	10,471	249	28,182
Alabama	1880	15	339	10	159			5	180
	1890	48	4,237	14	606			34	3,631
Colorado	1880								
	1890	2	220					2	220
Connecticut	1880	8	91	8	91				
	1890	9	129	9	129				
Georgia	1880	10	144	8	69			2	75
	1890	5	259	3	84			2	175
Illinois	1880	10	603					10	603
	1890	15	2,772					15	2,772
Indiana	1880	4	73	1	15			3	58
	1890	2	60					2	60
Kentucky	1880	22	392	18	205			4	187
	1890	6	323	1	17			5	306
Maine	1880	1	18	1	18				
	1890	1	18	1	18				
Maryland	1880	22	281	13	113	5	111	4	57
	1890	14	713	7	112	3	75	4	526
Massachusetts	1880	6	81	5	53	1	28		
	1890	4	55	4	55				
Michigan	1880	27	844	25	709	2	135		
	1890	26	1,216	26	1,216				
Minnesota	1880	1	40	1	40				
	1890	1	150					1	150
Missouri	1880	17	749	9	249			8	500
	1890	8	550	3	120			5	430
New Jersey	1880	20	691			20	691		
	1890	18	926			18	926		
New York	1880	57	1,654	15	172	42	1,482		
	1890	37	2,109	9	166	24	1,253	4	690
North Carolina	1880	7	39	7	39				
	1890	1	15	1	15				
Ohio	1880	103	3,201	33	434			70	2,767
	1890	71	5,713	11	134			60	5,579
Oregon	1880	1	12	1	12				
	1890	1	42	1	42				
Pennsylvania	1880	269	8,490	36	242	158	4,940	75	3,308
	1890	221	19,093	15	179	125	8,217	81	10,697
Tennessee	1880	21	388	16	165			5	223
	1890	19	1,109	7	193			12	916
Texas	1880	1	10	1	10				
	1890	3	130	3	130				
Utah	1880	2	18	2	18				
	1890								
Vermont	1880	1	11	1	11				
	1890								
Virginia	1880	31	287	24	165			7	122
	1890	31	1,200	18	160			13	1,040
Washington	1880								
	1890	1	30	1	30				
West Virginia	1880	11	319	5	29			6	290
	1890	5	525					5	525
Wisconsin	1880	14	473	11	288	3	185		
	1890	10	842	6	377			4	465

Of the 559 furnaces at the close of the census year 1890, which were active or likely to be some day active, 170 were anthracite coal or anthracite coal and coke furnaces, 249 coke and bituminous coal furnaces, and 140 charcoal furnaces. Of the 681 furnaces at the close of 1880 there were 231 anthracite coal or anthracite coal and coke furnaces, 199 coke and bituminous coal furnaces, and 251 charcoal furnaces. In the decade from 1880 to 1890 there is shown a decrease of 61 in the number of furnaces using anthracite coal or a mixture of anthracite coal and coke for fuel, a decrease of 111 in the number of furnaces using charcoal and an increase of 50 in the number of furnaces using coke and bituminous coal.

MANUFACTURE OF PIG IRON WITH MINERAL FUEL.

The phenomenal growth of the manufacture of pig iron during the past 10 years has been largely due to the increased use of coke as a blast furnace fuel. In 1880 anthracite coal was extensively employed alone and also as a mixture with coke in the blast furnaces, but the tendency since that date has been toward a more general employment of coke. Of the 3,345,703 net tons of pig iron produced in 1880 by the use of mineral fuel, 1,113,560 tons were produced with anthracite coal for fuel, 1,517,553 tons with coke, or in some instances with a mixture of coke and bituminous coal, and 714,590 tons with a mixed fuel of anthracite coal and coke. Very few furnaces are now run on anthracite coal alone, and a number of the furnaces that used anthracite coal in part in 1880 have since either abandoned the use of anthracite coal or increased the percentage of coke in the mixed fuel. In 1890 there were produced 330,886 tons of pig iron with anthracite coal for fuel, 1,893,241 tons with mixed anthracite coal and coke, and 7,017,769 tons with coke alone or, in a few instances, with a mixture of coke and bituminous coal.

The following comparative summary exhibits the leading statistics of the manufacture of pig iron with mineral fuel, as reported at the censuses of 1880 and 1890:

COMPARATIVE SUMMARY, MINERAL FUEL BLAST FURNACES: 1880 AND 1890. (*a*)

ITEMS.	1880 (*b*)	1890
Number of establishments	225	221
Capital	$70,262,615	c$116,894,982
Miscellaneous expenses	(*d*)	$5,330,381
Average number of employés (aggregate)	25,025	30,908
Total wages	$8,554,152	$14,666,139
Officers, firm members, and clerks:		
Average number	(*e*)	807
Total wages		$1,256,742
All other employés:		
Average number	(*e*)	30,101
Total wages		$13,409,397
Cost of materials used	$51,254,711	$101,699,485
Value of products	$76,739,573	$133,658,050
Tons of pig iron	3,345,703	9,241,896

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Includes hired property valued at $4,807,470. This item was not reported separately at the census of 1880.

d Not reported.

e Not reported separately.

The following comparative statement exhibits the leading statistics of the manufacture of pig iron by the use of mineral fuel, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, MINERAL FUEL BLAST FURNACES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The United States	*b*1880	225	$70,262,615	25,025	$8,554,152	$51,254,711	$76,739,573
	1890	221	*c*116,894,982	*d*30,908	*d*14,666,139	101,699,485	133,658,050
Alabama	1880	2	955,800	300	60,257	233,353	554,162
	1890	17	12,394,757	3,425	1,482,021	5,182,180	8,374,816
Georgia	1880	2	252,000	274	14,750	188,983	319,150
	*e*1890						
Illinois	1880	3	950,000	498	185,054	1,762,609	2,391,850
	1890	5	9,855,274	1,431	919,145	8,088,153	10,138,310
Indiana	1880	2	355,000	95	48,610	332,481	450,535
	*e*1890						
Kentucky	1880	3	550,000	190	77,550	504,974	793,800
	*e*1890						
Maryland	1880	4	1,160,000	770	163,499	433,060	758,850
	*e*1890						
Massachusetts	1880	1	50,000	40	18,500	68,226	144,060
	1890						
Missouri	1880	2	2,050,000	479	169,111	1,410,124	1,765,017
	1890	3	1,262,475	393	172,363	900,319	1,191,502
New Jersey	1880	12	3,644,500	1,174	365,639	2,488,670	3,428,747
	1890	8	3,131,366	655	262,538	1,679,937	2,228,724
New York	1880	22	8,059,384	2,050	762,210	3,712,160	6,009,097
	1890	13	5,850,119	1,385	634,399	3,964,464	4,850,543
Ohio	1880	45	10,022,586	5,514	1,752,741	8,233,013	11,646,754
	1890	37	10,985,403	3,939	1,971,691	15,387,430	19,355,162
Pennsylvania	1880	116	39,048,294	11,975	4,368,562	29,087,348	44,385,123
	1890	105	58,494,262	15,752	7,592,226	56,922,660	74,837,755
Tennessee	1880	3	810,626	623	145,867	393,685	640,957
	1890	7	2,827,085	855	417,989	2,018,044	2,702,548
Virginia	1880	1	500,000	200	94,781	76,179	178,920
	1890	10	3,874,606	1,216	527,178	2,720,195	3,755,651
West Virginia	1880	6	1,254,425	608	211,484	1,131,176	1,583,896
	1890	4	1,446,082	424	198,933	1,503,847	2,009,505
Wisconsin	1880	1	600,000	235	115,537	1,198,670	1,688,656
	1890	3	2,284,509	336	159,448	1,294,123	1,620,117
All other states	*e*1890	9	4,489,044	1,097	328,208	2,038,133	2,593,417

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Includes hired property valued at $4,807,470. This item was not reported separately at the census of 1880.

d Includes 807 officers, firm members, and clerks, and their wages, amounting to $1,256,742, distributed as follows: Alabama 102, $183,686; Illinois 11, $23,115; Missouri 10, $16,343; New Jersey 15, $22,386, New York 47, $84,381; Ohio 138, $176,115; Pennsylvania 341, $545,070; Tennessee 44, $60,106; Virginia 49, $71,177; West Virginia 13, $16,758; Wisconsin 8, $12,294; all other states 29, $45,311. These classes were not reported separately at the census of 1880.

e Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 1; Georgia, 2; Indiana, 2; Kentucky, 2; Maryland, 2.

CAPITAL.

The following comparative statement shows the distribution of capital in active and idle establishments and those in course of construction, as reported for blast furnaces using mineral fuel at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, MINERAL FUEL BLAST FURNACES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	275	*a*$77,161,257	$40,933,422	$36,227,835
	1890	277	*b*123,610,211	68,880,895	54,729,316
Establishments in operation	1880	225	70,262,615	36,605,322	33,657,293
	1890	221	116,894,962	63,733,797	53,161,165
Idle establishments	1880	46	5,833,083	3,898,650	1,934,433
	1890	40	4,411,010	3,304,000	1,107,010
Establishments in course of construction	1880	4	1,065,559	429,450	636,109
	1890	16	2,304,219	1,843,098	461,121

a See remarks in regard to the inclusion of capital relating to mining and other operations in the figures for 1880.

b Includes hired property valued at $4,807,470. This item was not reported separately at the census of 1880.

The total capital reported for 1880 included in a number of cases the investment of blast furnace companies in mining and other operations, so that comparison with the amount reported for 1890, which excluded data of this character, will not be a correct indication of the increase in capital during the decade.

In the few instances where establishments operated both mineral fuel and charcoal furnaces separate returns were obtained for each branch of manufacture, so that the details for the two branches could be presented independently.

In 1880 there were 430 completed furnace stacks equipped for the use of mineral fuel, with a total daily capacity of 15,942 tons of 2,000 pounds, as compared with 419 stacks in 1890 with a daily capacity of 38,653 tons. The average daily capacity per furnace was 37.07 net tons in 1880 and 92.25 net tons in 1890. The increase in daily capacity, notwithstanding the reduction in the number of stacks, is due to larger furnaces in 1890, together with more powerful blowing machinery, improved hot blast stoves, and better furnace practice.

EMPLOYÉS AND WAGES.

The following statement presents the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés in the manufacture of pig iron with mineral fuel, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, MINERAL FUEL BLAST FURNACES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	30,908	$14,666,139	30,858	$14,651,424	5	$2,350	65	$12,365
Officers or firm members	362	893,489	362	893,489	.....	.....	.....	.....
Clerks	445	363,253	440	360,903	5	2,350	.....	.....
Skilled	8,270	4,839,439	8,270	4,839,439	.....	.....	.....	.....
Unskilled	21,831	8,569,958	21,766	8,557,593	.....	.....	65	12,365

The following statement presents the average number of skilled and unskilled employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, MINERAL FUEL BLAST FURNACES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.	
	Males above 16 years.	Children.
Total	30,036	65
Under $5	147	42
$5 and over but under $6	164	23
$6 and over but under $7	1,745	.....
$7 and over but under $8	4,184	.....
$8 and over but under $9	4,937	.....
$9 and over but under $10	5,903	.....
$10 and over but under $12	6,143	.....
$12 and over but under $15	4,447	.....
$15 and over but under $20	1,662	.....
$20 and over but under $25	505	.....
$25 and over	199	.....

In the best coke practice at the present time the direct labor cost in a ton of pig iron averages about 15 per cent of the total cost. This is labor employed at the furnace, and does not include the indirect labor which is embraced in the cost of the raw materials and fuel. When the entire cost of the labor entering into the production of 1 ton of pig iron is considered, including the labor paid for the mining of the ore, limestone, and fuel, and the labor cost entering into the transportation of these materials to the furnace, it is found that fully 80 per cent of the cost of making a ton of pig iron is paid for labor. The complete labor cost varies according to the distance the materials have to be transported, the richness of the ores, and the efficiency of the furnace plant. In the southern states the ease with which the various raw materials are mined and the low cost of assembling them at the furnace

furnishes a lower aggregate labor cost in a ton of pig iron than in the north, although the direct labor cost per ton is greater in the former section than in the latter. Wages of furnace hands in the two sections vary within narrow limits for the same class of labor, but the richer ores used in the northern furnace insure a larger daily product, which gives a lower rate of direct labor cost per ton than is possible in the southern furnace, where a smaller product per man is made with the lower percentage of iron in the ores.

MATERIALS USED.

The following comparative statement presents the quantity and cost of the various raw materials used by the mineral fuel blast furnaces, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, MINERAL FUEL BLAST FURNACES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Tons.	Cost.	Tons.	Cost.
Total		$51,254,711		$101,699,485
Domestic iron ore	6,319,633	29,689,649	14,428,520	54,000,703
Foreign iron ore	(a)		1,081,630	5,860,349
Fluxing material	3,054,482	2,446,767	5,470,107	4,037,699
Anthracite coal	2,615,182	8,012,755	2,012,477	5,165,761
Bituminous coal	1,051,753	2,095,887	551,007	759,522
Coke	2,128,255	8,129,240	9,234,522	27,422,751
Mill cinder and scrap	338,392	841,451	1,282,371	3,084,391
All other materials		38,962		1,368,309

a Domestic and foreign iron ore were not reported separately in 1880.

During 1880 there was consumed by 1 anthracite furnace in New York 5,000 bushels of charcoal, costing $350, and by 1 bituminous furnace in Ohio, 1,600 bushels of charcoal, costing $112. As neither of the furnaces reported the production of any charcoal pig iron in that year, the quantity and cost of the charcoal consumed is excluded from the presentation of the charcoal pig iron industry and included in the above table under the head of "All other materials".

During 1890 1 charcoal furnace in Alabama and 1 in North Carolina ran a short time on coke for fuel. As these establishments are properly classified as charcoal furnaces, the leading items of investment, labor, and materials are included in the tabular statements for the charcoal blast furnace industry. The exclusion of the 3,413 tons of coke valued at $13,029 from the above table causes an apparent discrepancy between the tons and cost of the coke as here given and the aggregate consumption for the whole country in the manufacture of pig iron as previously presented.

The development of the extensive deposits of high grade ores in the Lake Superior district, in response to the demands of a rapidly growing steel industry, and the economies made possible by the more extended use of coke in the manufacture of pig iron have led to an important change in the character of the raw materials consumed by blast furnaces since 1880. Throughout the southern states the more careful selection and preparation of iron ores and the employment of better coke has increased to a considerable extent the efficiency of furnaces in that section, while in many districts in the north and west the use of local ores containing a low percentage of iron has been abandoned for the richer Lake Superior iron ores. In addition there has taken place a more general substitution of coke for the bituminous coal which was largely employed in 1880 either alone or as an important constituent of a mixed fuel of bituminous coal and coke. At the census of 1880 25 furnaces reported the use of bituminous coal exclusively as a blast furnace fuel, these works consuming 369,976 tons of bituminous coal in producing 113,778 tons of pig iron. In 1890 only 6 furnaces used bituminous coal alone, and the quantity of pig iron made by them was 47,837 tons, with a fuel consumption of 152,456 tons. There has also been a marked decline during the decade in the number of furnaces using a mixed fuel of bituminous coal and coke, and the proportion of coal to coke, where they are still used together, has also decreased. In addition to the above quantities, there were consumed in 1880, principally as a mixture with coke in the blast furnaces, 681,777 tons of bituminous coal, but in 1890 only 398,551 tons of this kind of coal were so consumed. These figures include coal used under the boilers in cases where the waste gases from the furnace were not sufficient to supply the requisite amount of heat for the production of steam. In 1880 a considerable quantity of anthracite coal was mixed with coke in furnaces in Illinois and Wisconsin, but no fuel of this character was used in producing pig iron in these states in 1890.

PRODUCTS.

The following comparative statement shows the quantity and value of pig iron produced, classified according to the fuel used by blast furnaces using mineral fuel, as reported at the censuses of 1880 and 1890. The quantities and values of castings produced direct from furnaces are included in the production of pig iron for the two periods.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF PRODUCTS, MINERAL FUEL BLAST FURNACES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Tons.	Value.	Tons.	Value.
Total		$76,739,573		$133,658,050
Mixed coke and anthracite coal pig iron	714,590	16,627,291	1,893,241	28,195,996
Coke and bituminous coal pig iron	1,517,553	35,513,233	a7,015,547	a100,659,928
Anthracite coal pig iron	1,113,560	23,574,742	330,886	4,772,021
Total tonnage and value	3,345,703	75,715,266	9,239,674	133,627,945
All other products		1,024,307		30,105

a Does not include 2,222 tons of coke pig iron, valued at $27,328, reported by charcoal furnaces.

MANUFACTURE OF CHARCOAL PIG IRON.

The abundant deposits of iron ores in sections of the country remote from sources of supply of mineral fuel, but containing extensive forests available for the production of charcoal, combined with the excellent character of the metal produced by the use of this fuel, are influences which have resulted in maintaining for the manufacture of charcoal pig iron an important position in the iron industry. These conditions are especially prominent in Michigan and Wisconsin. The former state uses charcoal fuel exclusively in its blast furnaces, and produced in the census year 1890 over one-third of all the charcoal pig iron made in the United States during that period.

The following comparative summary exhibits the leading statistics of the charcoal pig iron industry, as reported at the censuses of 1880 and 1890:

COMPARATIVE SUMMARY, CHARCOAL BLAST FURNACES: 1880 AND 1890. (a)

ITEMS.	1880 (b)	1890
Number of establishments	116	83
Capital	$19,268,747	c$17,713,561
Miscellaneous expenses	(d)	$1,012,294
Average number of employés (aggregate)	e16,670	3,575
Total wages	e$4,101,276	$1,560,006
Officers, firm members, and clerks:		
Average number	(f)	261
Total wages		$354,945
All other employés:		
Average number	(f)	3,314
Total wages		$1,205,061
Cost of materials used	$7,365,031	$8,799,130
Value of products	$12,575,996	$11,985,103
Tons of pig iron	435,318	664,711

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Includes hired property valued at $253,588. This item was not reported separately at the census of 1880.

d Not reported.

e Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota and included in the totals published at the census of 1880. These employés were engaged in making repairs to plant.

f Not reported separately.

Notwithstanding the decline in the value of products from 1880 to 1890, as indicated by the above figures, the output of charcoal pig iron has increased during the decade from 435,318 net tons in 1880 to 664,711 net tons in 1890, or 52.70 per cent. The decrease in the number of establishments arises from the fact that many of the small charcoal furnaces included in the presentation for 1880 have been abandoned and fewer, but much larger and better equipped stacks, have been erected in locations more favorably situated for securing an abundance of low priced materials. The decrease in capital, number of employés, and wages is largely due to the different methods pursued in obtaining the data for the two census periods, the figures for 1880, as previously explained, including the operations of other branches of industry which are excluded in the presentation for 1890.

There are a few manufacturers who operate anthracite coal or coke furnaces in addition to stacks running on charcoal pig iron. In such cases the operations of the charcoal furnaces only are included in the figures presented, the accounts of the two departments enabling a separation to be made.

The following comparative statement exhibits the leading statistics of the charcoal pig iron industry, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, CHARCOAL BLAST FURNACES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The United States	*b*1880	116	$19,268,747	*c*16,670	*c*$4,101,276	$7,365,031	$12,575,[illegible]96
	1890	83	*d*17,713,561	*e*3,575	*e*1,560,006	8,399,130	11,985,103
Alabama	1880	5	1,751,396	1,266	493,456	342,320	851,194
	1890	11	3,38[illegible],029	714	301,679	1,311,704	1,940,875
Connecticut	1880	6	1,172,000	139	65,974	471,467	644,911
	1890	5	940,092	129	66,881	412,743	574,438
Georgia	1880	3	460,000	480	62,665	52,813	147,740
	*f*1890						
Indiana	1880	1	100,000	213	6,230	3,125	10,000
	1890						
Kentucky	1880	6	1,548,035	1,700	352,438	296,436	454,8[illegible]2
	*f*1890						
Maine	1880	1	150,000	300	44,950	23,569	60,375
	*f*1890						
Maryland	1880	8	1,037,125	673	176,479	523,746	941,489
	1890	3	457,650	127	47,017	221,887	333,6[illegible]3
Massachusetts	1880	1	582,000	350	157,500	100,800	168,7[illegible]0
	*f*1890						
Michigan	1880	13	2,671,386	2,164	561,870	2,091,224	3,145,[illegible]62
	1890	15	5,259,001	732	416,334	2,915,233	3,982,278
Missouri	1880	2	400,000	706	58,000	275,000	510,000
	*f*1890						
New York	1880	8	777,087	468	140,719	454,462	[illegible]07,141
	1890	3	593,089	77	37,889	248,424	332,063
Ohio	1880	17	2,980,000	3,430	972,416	916,607	1,391,439
	1890	9	765,094	285	85,436	309,235	445,106
Oregon	1880	1	100,000	250	46,822	33,073	78,393
	*f*1890						
Pennsylvania	1880	21	2,440,000	1,485	384,276	587,727	1,188,627
	1890	11	827,308	215	53,489	299,821	401,[illegible]48
Tennessee	1880	6	612,000	956	116,030	95,755	199,065
	1890	4	858,721	221	108,003	432,838	663,916
Texas	1880	1	40,000	140	27,720	2[illegible],580	36,000
	*f*1890						
Vermont	1880	1	20,000	26	2,035	13,800	24,800
	1890						
Virginia	1880	7	891,500	1,021	161,205	129,369	26[illegible],775
	1890	5	281,600	112	31,134	99,972	169,830
West Virginia	1880	2	68,000	285	28,674	27,435	47,200
	1890						
Wisconsin	1880	6	1,468,218	618	241,817	902,723	1,607,180
	1890	5	1,261,831	275	147,593	1,083,883	1,494,775
All other states	*f*1890	12	3,085,146	688	264,551	1,043,390	1,646,[illegible]71

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Does not include 180 employés and $25,275 wages, reported by an idle establishment in Minnesota, and included in the totals published at the census of 1880. These employés were engaged in making repairs to plant.

d Includes hired property valued at $253,588. This item was not reported separately at the census of 1880.

e Includes 261 officers, firm members, and clerks, and their wages amounting to $354,945, distributed as follows: Alabama 48, $78,710; Connecticut 12, $16,247; Maryland 5, $5,530; Michigan 57, $95,312; New York 5, $6,800; Ohio 29, $24,775; Pennsylvania 14, $16,337; Tennessee 20, $27,510; Virginia 11, $9,030; Wisconsin 8, $17,869; all other states 52, $56,834. These classes were not reported separately at the census of 1880.

f Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Georgia, 2; Kentucky, 2; Maine, 1; Massachusetts, 1; Missouri, 2; North Carolina, 1; Oregon, 1; Texas, 1; Washington, 1.

During the decade from 1880 to 1890 the charcoal blast furnace establishments, including active and idle, in Kentucky declined in number from 15 to 2; those in Massachusetts from 3 to 2, and those in North Carolina from 5 to 1. Maine and Oregon had 1 establishment in each year, while the establishment located in the state of Washington commenced operations during the past decade. Since 1880 the manufacture of charcoal pig iron has been abandoned in Indiana, Minnesota, Vermont, West Virginia, and Utah, but Indiana, Minnesota, and West

Virginia continue to manufacture pig iron with mineral fuels. A charcoal blast furnace was put in operation in California in 1881, but was abandoned prior to the census year 1890.

CAPITAL.

The following comparative statement shows the distribution of capital in active and idle establishments and those in course of construction, as reported for charcoal blast furnaces at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, CHARCOAL BLAST FURNACES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished product on hand, cash, and bills receivable.
Total	1880	215	a$27,989,919	$7,066,659	$20,923,260
	1890	123	b20,023,715	9,108,800	10,914,915
Establishments in operation	1880	116	19,268,747	4,663,159	14,605,588
	1890	83	17,713,561	7,502,251	10,211,310
Idle establishments	1880	96	8,561,800	2,378,500	6,183,300
	1890	33	2,047,855	1,391,150	656,705
Establishments in course of construction	1880	3	159,372	25,000	134,372
	1890	7	262,299	215,399	46,900

a See remarks in regard to the inclusion of capital relating to mining and other operations in the figures for 1880.
b Includes hired property valued at $253,588. This item was not reported separately at the census of 1880.

The value of buildings, machinery, tools, and implements more nearly represents the direct investment in the charcoal blast furnace industry than that shown for land and cash assets, for the reason that the aggregate for these latter items for 1880 also includes the value of ore and wood lands. Thus, while there was an increase during the last decade of 28.90 per cent in the value of the plant and equipment of furnaces, the remaining items of investment show an apparent decrease of 47.83 per cent. The value of land was not separately reported in 1880, therefore a true comparison can not be made.

Of the 123 establishments reported in 1890, 33 remained idle during the census year, and 7 were in course of construction, while 96 of the 215 establishments reported in 1880 were not in operation at any time during that period, and 3 plants were building.

Notwithstanding the fact that the number of establishments equipped for the production of charcoal pig iron has decreased from 215 in 1880 to 123 in 1890, and the furnace stacks at the close of the census year 1890 number but 140, as compared with 251 10 years ago, the daily productive capacity increased from 3,306 tons of 2,000 pounds in 1880 to 3,783 tons in 1890. This increase in capacity is due in part to the much larger size of the new furnaces and in part to the adoption in recent years of more efficient machinery and better furnace practice.

EMPLOYÉS AND WAGES.

The following statement shows the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, CHARCOAL BLAST FURNACES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	a3,575	$1,560,006	3,564	$1,557,911	2	$660	9	$1,435
Officers or firm members	144	280,723	144	280,723				
Clerks	117	74,222	115	73,562	2	660		
Skilled	824	421,752	824	421,752				
Unskilled (a)	2,490	783,309	2,481	781,874			9	1,435

a Includes convict laborers at the Texas penitentiary receiving an average of 50 cents per day.

The following statement presents the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, CHARCOAL BLAST FURNACES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.	
	Males above 16 years.	Children.
Total	3,305	9
Under $5	a88	4
$5 and over but under $6	105	5
$6 and over but under $7	418	.....
$7 and over but under $8	683	.....
$8 and over but under $9	676	.....
$9 and over but under $10	448	.....
$10 and over but under $12	433	.....
$12 and over but under $15	275	.....
$15 and over but under $20	97	.....
$20 and over but under $25	36	.....
$25 and over	46	.....

a Includes convict laborers at the Texas penitentiary receiving an average of 50 cents per day.

In 1880 the charcoal furnaces were in operation an average of 6.45 months each during the year. During the census year 1890 the charcoal furnaces were in operation an average of 8.04 months each; the average term of employment for men was 8.87 months.

The excess of the average term of employment for labor over the average term of operation is due to the fact that the works reporting the maximum term of operation also report the largest number of hands. Furnace hands were employed 12 hours per day 7 days each week, while yard hands worked 10 hours daily for 6 days of the week.

MATERIALS USED.

The following comparative statement shows the quantity and cost of the various materials consumed by charcoal blast furnaces, as reported at the censuses of 1880 and 1890. Iron ore and fluxing materials are stated in tons of 2,000 pounds, charcoal in bushels.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, CHARCOAL BLAST FURNACES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Cost.	Quantity.	Cost.
Total	.....	$7,365,031	.....	$8,399,130
Domestic iron ore	937,051	3,515,629	1,305,880	3,607,242
Foreign iron ore	(a)		9,082	37,236
Fluxing material	114,667	100,569	154,183	159,179
Charcoal	b53,903,228	b3,678,658	67,672,156	4,523,320
All other materials, including mill cinder and scrap	.....	70,175	.....	72,153

a Domestic and foreign iron ore were not reported separately at the census of 1880.

b There is a difference of 6,600 bushels of charcoal, costing $462, between the figures published in the census report for 1880 and those given in the above statement. This is due to the fact that 1 anthracite furnace in New York used 5,000 bushels of charcoal, costing $350, and 1 bituminous furnace in Ohio used 1,600 bushels of charcoal, costing $112. Neither of these establishments reported the production of any charcoal pig iron during the census year 1880, and the quantity and cost of charcoal consumed by them are therefore not included in the presentation of the statistics of the charcoal pig iron industry.

PRODUCTS.

The following comparative statement shows the quantity and value of hot and cold blast charcoal pig iron, including the quantity and value of direct castings and other products made by the charcoal furnaces, as reported at the censuses of 1880 and 1890, the quantities being stated in tons of 2,000 pounds:

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF PRODUCTS, CHARCOAL BLAST FURNACES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Tons.	Value.	Tons.	Value.
Total	.....	$12,575,996	.....	$11,985,103
Hot or warm blast charcoal pig iron	355,647	10,090,244	627,865	11,243,119
Cold blast charcoal pig iron	79,671	2,398,500	36,846	714,591
Total tonnage and value	435,318	12,488,744	664,711	11,957,710
All other products	.....	87,252	.....	a27,393

a Includes $27,328, the value of 2,222 tons coke pig iron.

The increase in tonnage shown in this table was entirely in hot or warm blast pig iron, the production of cold blast iron showing a decline of 53.75 per cent. Two charcoal furnaces produced a small quantity of coke pig iron in 1890, one in Alabama producing 1,645 tons, valued at $15,788 and one in North Carolina producing 577 tons valued at $11,540. The tonnage of this coke pig iron is not included in the column of quantities in the above table, but the value appears under the head of "Value of all other products". The employés, total wages, and materials consumed by these 2 charcoal furnaces in the production of this coke pig iron, are also included in the statements concerning the charcoal blast furnace industry. In the report for the blast furnace industry, 1890, these items are included in the statement showing the output of coke and bituminous coal pig iron.

ROLLING MILLS AND STEEL WORKS.

Of the total tonnage of products of the rolling mills and steel works of the United States in 1880 less than one-third was of steel, and up to that time the manufacture of rails was the only branch of the iron industry that had been seriously affected by the manufacture of steel. The steel industry has made a steady and rapid advance since 1880. During 1890 the total output of iron and steel products by the rolling mills and steel works was 8,274,833 tons, of which 5,049,693 tons, or 61.02 per cent, were of steel. The activity in the erection of bessemer and open-hearth steel making plants since 1880 has been especially marked.

Notwithstanding the increase of the steel industry during the past 10 years, the manufacture of finished forms of iron has not declined. The number of puddling furnaces has increased from 4,376 in 1880 to 4,853 in 1890, and the increase in the tonnage of iron products has been from 2,353,248 tons to 3,225,140 tons. In the manufacture of boiler plates, sheets, and bridge material iron is still largely used, and in many instances preferred to steel.

In 1880 the statistics of rolling mills and steel works were presented under three general classifications, namely, (1) iron rolling mills, (2) bessemer and open-hearth steel works, and (3) crucible and miscellaneous steel works. Where establishments operated both an iron rolling mill and a steel producing plant, a separate return was required for each department; but manufacturers found it difficult, and in some instances impossible, to report accurately the leading items relating to capital and labor for each branch of manufacture. The steel was often rolled by the same workmen and upon the same machinery as the iron, while the capital was employed both in manufacturing and marketing the products of the rolling mill whether of iron or of steel. With the ramifications of the iron and steel industry during the past decade, the difficulty of making any separate showing of the rolling mills and steel producing works has been correspondingly increased, and the returns received indicated that the only separation practicable in the presentation of the statistics of iron and steel rolling mills, and bessemer, open-hearth, and crucible steel works was in the tonnage and value of iron and steel products. Even this separation was not made without considerable difficulty on the part of the manufacturers.

It has not been possible to present in detail the statistics which relate to special branches of iron and steel manufacture, such as nails, bars, structural material, and steel rails. Establishments producing rails, bars, or plates make other products, and a separation of the capital, employés, wages, and materials pertaining to the manufacture of each article was impracticable.

BESSEMER STEEL.

Bessemer steel was first produced in this country in commercial quantities in 1867, but for many years the material was used only in the manufacture of rails. At the date of the Tenth Census there were but 11 establishments engaged in the production of bessemer steel, all of which had been built to manufacture steel for rails, many of them having been added to existing iron rail mills. These works were located in Illinois, Missouri, New York, Ohio, and Pennsylvania. In 1890 the number of establishments containing bessemer converters, including the works prepared to manufacture Clapp Griffiths and Robert-Bessemer steel, had increased to 51. They were located in Colorado, Illinois, Indiana, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania, Virginia, and West Virginia. The production of bessemer steel ingots or direct castings in the United States in the census year 1890, including steel made by the Clapp-Griffiths and Robert-Bessemer processes, amounted to 4,051,262 tons of 2,000 pounds, an increase of 311.21 per cent over the production of 985,208 tons in 1880. Pennsylvania produced 56.47 per cent of the total output in 1880, Illinois 25.73 per cent, and New York and Ohio each over 8 per cent. Of the total production in 1890, Pennsylvania contributed 61.12 per cent, Illinois 21.49 per cent, Ohio 9.41 per cent, West Virginia 4.46 per cent, New York 2.60 per cent, and Colorado, Massachusetts, and Michigan each less than 1 per cent.

While the demand for steel rails has forced a practical discontinuance of the manufacture of iron rails, there has been also rapidly increasing use of steel for nails, bars, plates, rods, wire, forgings, and other miscellaneous products. During 1880 and the few succeeding years, the crude steel consumed by the iron rolling mills in the production of finished forms of steel other than rails was purchased from foreign sources or from the domestic steel works, the latter turning the product of their converters into billets and slabs during periods when the demand for rails was not sufficient to absorb the entire steel production. With the increasing demand for steel for miscellaneous purposes, many of the iron rolling mill establishments erected plants for the production of the crude steel required by them, some works adopting the bessemer process, while others added open-hearth plants, the character of the products to be made largely influencing the choice of the process employed. The increased quantity of bessemer steel manufactured into miscellaneous forms other than rails is approximately shown by a comparison of the ingots and rail production in the two years, over 75 per cent of the ingots made in 1880 being converted into rails, while in 1890 the percentage of rails made to the total output of ingots was only 51 per cent.

As a material for use in the manufacture of products requiring strength with resistance to ordinary wear, bessemer steel has proved its superiority as compared with malleable iron. The question of quality is not, however, the only factor which has influenced the relative consumption of the products of the bessemer converters and the puddling furnace. The two processes, presenting as they do characteristics entirely dissimilar, are nevertheless very much alike in principle. In the puddling furnace, the constituents of the pig iron are oxidized by the severest kind of labor on the part of the workmen, the process occupying considerable time and resulting in the expenditure of a large amount of fuel. In the bessemer process the pig iron taken in a molten state from the blast furnace is run directly into the converter, the passage of air through the material achieving the same results as secured by the work of the puddler, while the oxidizing influences of the blast furnish all the heat that is required to effect the conversion. The only fuel consumed is, therefore, the amount employed to furnish power for the blowing engine. The time required to complete the process of steel making, as carried on in the bessemer converter, is so much less than that consumed in the puddling of iron, that the cost for labor per ton of steel is considerably below the cost per ton of iron when produced from the same materials.

Since 1880 2 modifications of the bessemer process have been introduced into this country: the Clapp-Griffiths process from England in 1884, and the Robert-Bessemer process from France in 1888. In the decarbonization and desiliconization of the molten metal by the use of air, these processes do not differ from the ordinary bessemer method of producing steel, but certain modifications of the converters are claimed to have an important effect upon the character of the product. In the Clapp-Griffiths process the converter ranges in capacity from 2 to 3 tons, while the Robert-Bessemer converter is designed for the production of from 1 to 2 tons of steel at each operation.

The first steel made in this country by the Clapp-Griffiths process was produced at Pittsburg, Pa, on March 25, 1884. During 1890 there were 6 works which contained converters for the production of steel by this process, 4 of which were in operation in that year, producing 77,632 tons of steel ingots, or direct castings. No new plants have been built since 1887. The first steel produced in this country by the Robert-Bessemer process was made at experimental works at Springfield, Ohio, in September, 1888. During 1890 there were 5 completed works containing converters for the production of steel by this process, and 1 plant was in course of construction. The production of Robert-Bessemer steel during 1890 amounted to 4,884 tons, principally in the form of castings.

OPEN-HEARTH STEEL.

The Siemens-Martin or open-hearth process of steel making has shown a continuous growth since its introduction in the United States in 1867. The production of open-hearth steel in the form of ingots or direct

castings during 1890 amounted to 537,639 tons of 2,000 pounds, as compared with 84,302 tons made during 1880. In 1880 there were 25 establishments containing open-hearth steel plants located in 10 states, and in 1890 there were 58 establishments containing open-hearth steel plants located in 12 states. Since 1880 the manufacture of open-hearth steel has been abandoned in 2 states, Vermont and Rhode Island, and 4 states have engaged in its manufacture, New York, Alabama, Indiana, and California. During the past few years great activity has taken place in the erection of open-hearth steel plants.

The open-hearth furnace consists of a shallow, dish shaped vessel, varying in capacity from 8 tons to 30 tons, in which is prepared a bath of melted pig iron, to which either scrap steel or iron ore is added as a reducing agent, the whole contents of the furnace being subjected to a high temperature by the passage of highly heated artificial gas or of natural gas. The percentage of carbon required in the finished steel is replaced, as in the bessemer process, by the addition of spiegeleisen or ferro-manganese. The process of conversion occupies from 6 to 8 hours, and by reason of the time thus required it does not admit of the heavy daily tonnage of steel, which is one of the important characteristics of works employing the bessemer process. So perfectly, however, is the process under control that the contents of several furnaces may be combined in the production of heavy masses of metal of uniform composition for steel castings or forgings. The recognized superiority in strength and the uniformity of steel forgings as compared with those made of wrought iron has led manufacturers since 1880 to erect the necessary plant and machinery for the production and manipulation of the large masses of steel required in the manufacture of heavy shafting, armor plates, gun forgings, and parts of marine engines and war vessels.

BASIC STEEL.

The first basic steel made in the United States was produced experimentally at Steelton, Pa., by the Pennsylvania Steel Company, on May 24, 1884, in a bessemer converter. The beginning of the manufacture of basic steel in this country as a commercial product, however, was on the 28th of March, 1888, when the first basic open-hearth steel was produced at the Homestead Steel Works, near Pittsburg, Pa. Since that date the manufacture of basic open-hearth steel has been continued at these works. Many other works throughout the country experimented with the basic process, but, except as above stated, very little progress has been made in the introduction of this method of steel making.

The total production of basic steel in the United States during 1890 amounted to 62,173 tons of 2,000 pounds, nearly all of which was made by the basic open-hearth method, a small part being produced by the duplex process, a combination of the bessemer and open-hearth methods.

CRUCIBLE AND MISCELLANEOUS STEEL.

The crucible steel industry has shown moderate progress since 1880, the production of that year amounting to 76,201 net tons of ingots or direct castings, as compared with an output of 82,748 tons in 1890. In 1880 there were 37 establishments containing crucible steel plants, located in 9 states, while in 1890 the number of establishments had increased to 47, located in 11 states. For purposes requiring a high grade of steel, the product of the crucible process will always be in demand, but in many instances the high cost of manufacture prevents it from successfully competing in price with the product of the open-hearth or bessemer processes.

A small quantity of blister, puddled, and other kinds of miscellaneous steel is annually made by a few establishments. During 1880 the total output of miscellaneous steel was 4,956 tons, produced by works in Connecticut, New Jersey, and Pennsylvania. The production in 1890 amounted to 3,961 tons, made in New Jersey and Pennsylvania.

IRON AND STEEL RAILS.

Of the total production of 1,217,497 net tons of iron and steel rails in the census year 1880, 741,475 tons were of bessemer steel, 466,917 tons of iron, and 9,105 tons of open-hearth steel. Practically all the rails at present consumed by the railroads of the country are of bessemer steel, the few tons of iron rails annually made being of light section for mine purposes. During the census year 1890 the output of bessemer steel rails was 2,076,325 tons, and of iron rails 15,361 tons.

A notable increase has taken place since 1880 in the capacity of the country for the production of steel rails, both by the remodeling and enlarging of the works in existence at that time and by the erection of new plants. Notwithstanding the great demand for steel rails, the requirements have been almost entirely supplied from American mills, the quantity imported during each year since 1880 being insignificant. The bessemer steel rails produced in 1880 were made almost entirely by the bessemer steel works, which had been built from 1865 to 1876 especially for this branch of manufacture, a small quantity being rolled by the iron rail mills from purchased steel blooms.

The developments of the past few years have been toward a concentration of the steel rail industry into a few establishments of large capacity, the production of rails to any considerable extent at the present time being possible only in works favorably located for the supply of cheap raw materials, and operated under the most improved methods of manufacture. So active has been the competition among the different mills that only those concerns which have been foremost in the adoption of improved labor-saving machinery are large producers at the present time. The destruction of capital in the steel rail industry during the past decade by the improvements in mechanical appliances has been enormous, costly machinery becoming obsolete long before worn out.

The total production of bessemer steel rails in 1890 was made by 18 firms or companies, 7 concerns contributing 1,984,394 tons, or 95.57 per cent of the total output in that year. These 7 concerns were engaged in the manufacture of standard sections of steel rails as a leading branch of their business, and were located as follows: 5 in Pennsylvania, controlling 7 plants; 1 in Illinois, with 4 plants, and 1 in Colorado with 1 plant. Practically the entire quantity of standard or heavy sections of steel rails made in 1890 were produced by these 12 plants. The 91,931 tons of steel rails made by the other 11 producers in 1890 were mostly light sections for street railway and mine purposes. Of these 11 establishments 4 were in Pennsylvania, 2 in Ohio, and 1 each in California, Indiana, West Virginia, Illinois, and Wisconsin.

Of the total production of iron and steel rails in 1880, Pennsylvania produced 46.81 per cent; Illinois, 22.50 per cent; Ohio, 8.90 per cent; New York, 7.57 per cent. The production in the remaining states was small. Indiana and Wisconsin produced 3.17 per cent and 2.43 per cent respectively. Kansas, Kentucky, and Tennessee slightly exceeded 1 per cent each, while the other 9 rail producing states and territories produced less than 1 per cent each. Of the rails of all kinds produced in 1890, Pennsylvania made 68.79 per cent; Illinois, 29.54 per cent; and Ohio 0.24. New York produced no rails during the census year 1890.

A large business was done in 1890 in the manufacture of light rails for street railways. The quantity produced in 1880 was less than 15,000 tons, while during 1890 the requirement amounted to over 100,000 tons.

Since 1880 the demands of the leading railroads of the country have been for heavier rails, necessitated by the greater rate of speed of both freight and passenger trains, increased weight of locomotives and cars, and the increased weight of freight per car. Rails weighing 56 pounds per yard were for many years the standard size, but these are rapidly being removed from the tracks of the principal roads and replaced by heavier sections. During the past few years 80, 85, and 90 pound rails have composed a considerable part of the tonnage of the various mills, while in a few instances rails weighing 100 pounds to the yard have been rolled for use at points where the traffic is particularly heavy.

CUT NAILS AND SPIKES.

Next to rails the most notable example of the substitution of steel for iron during the past 10 years is shown by the statistics of nail production. In 1880 the aggregate output of cut nails and spikes by the rolling mills and steel works was 5,056,600 kegs of 100 pounds each, all of which were made of iron. In 1890 the total production of cut nails and spikes amounted to 5,857,030 kegs, of which 3,704,604 kegs were of bessemer steel, 2,139,086 were of iron, and 13,340 kegs were of open-hearth steel.

The iron nail business has not only seriously felt the competition of the steel nail, but manufacturers of both iron and steel cut nails have been confronted with a new rival in the wire nail, the manufacture of which has made rapid progress during recent years. The production of iron and steel cut nails and wire nails in 1880 and 1890 was as follows:

QUANTITY OF IRON AND STEEL CUT NAILS AND WIRE NAILS MANUFACTURED: 1880 AND 1890.

ITEMS.	1880 (Kegs of 100 pounds.)	1890 (Kegs of 100 pounds.)
Total	5,056,600	8,750,346
Iron cut nails	5,056,600	2,139,086
Steel cut nails	.....	3,717,944
Wire nails	.....	2,893,316

Almost the entire quantity of iron and steel cut nails produced in 1880 and 1890 was made by establishments which rolled the nail plate; whereas of the total output of wire nails in 1890 1,142,927 kegs were made by 9 works, which rolled the rods and drew the wire consumed by them, while 1,750,389 kegs were made by 40 works which purchased either the rods or wire. These 40 establishments not operating rolling mills are not included in this report. Their nail production is shown in the foregoing statement for purposes of the comparison of the output of cut nails with wire nails. With the exception of 1,040 kegs, the entire quantity of wire nails produced in 1890 was of steel.

The Wheeling district is an important center of the cut nail industry. It includes the mills at Wheeling and its vicinity, in Ohio and Marshall counties in West Virginia, and in Belmont and Jefferson counties in Ohio. This district contributed 1,497,380 kegs of the total production of cut nails in 1880, and 1,814,069 kegs in 1890.

COMPARISONS.

In 1880 there were 397 rolling mills and steel works (including idle establishments and those in course of construction) in the United States, of which 324 were classed as iron rolling mills, 36 as bessemer and open-hearth steel works, and 37 as crucible and miscellaneous steel works. The 73 steel works of all kinds contained 24 bessemer converters, 37 open-hearth steel melting furnaces, and a capacity in the crucible steel works of using 2,691 pots at each heat.

Including idle establishments and those in course of construction, there were 440 rolling mills and steel works reported at the census of 1890. Of this number 299 were iron and steel rolling mills which were not connected with steel producing works, 130 were equipped for the production of crude steel, and 11 establishments in course of construction which were not classified. The 130 establishments which were prepared to manufacture steel comprised 51 bessemer steel plants (including 6 Clapp-Griffiths and 5 Robert-bessemer plants), 58 open-hearth steel plants, 44 crucible steel plants, and 7 plants for producing blister or other kinds of steel. Of these 130 steel producing establishments 16 controlled both bessemer and open-hearth steel plants, 1 controlled both bessemer and special steel plants, 10 controlled both open-hearth and crucible steel plants, and 3 controlled both crucible and blister steel plants. With the exception of 23 works, all the establishments engaged in the production of crude steel contained trains of rolls.

The steel works in 1890 contained 80 standard bessemer converters, 9 Clapp-Griffiths converters, 8 Robert-Bessemer converters, 129 open-hearth steel melting furnaces, and a capacity in the crucible steel works of employing 2,606 pots at each heat.

The following summary exhibits the leading statistics of rolling mills and steel works, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, ROLLING MILLS AND STEEL WORKS: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880	1890
Number of establishments	340	358	395
Capital	$61,120,015	$116,458,390	*c*$278,559,831
Miscellaneous expenses	(*d*)	(*d*)	$11,817,593
Average number of employés	47,099	96,164	140,537
Total wages	$26,843,767	$41,880,687	$79,293,673
Officers, firm members, and clerks	(*e*)	(*e*)	
Average number			3,242
Total wages			$4,833,240
All other employés	(*e*)	(*e*)	
Average number			137,295
Total wages			$74,460,453
Cost of materials used	$84,342,649	$130,104,493	$216,269,022
Value of products	*f*$129,921,144	$203,274,042	$331,860,872
Tons of products	1,491,586	3,411,562	8,274,833

a This statement includes only active establishments for the censuses of 1880 and 1890. Such establishments were not reported separately at the census of 1870.

b See remarks in regard to the depreciated currency of 1870.

c Includes hired property valued at $3,212,000. This item was not reported separately at previous censuses.

d Not reported.

e Not reported separately.

f Includes values for which tonnage was not reported.

The comparative statement on the following page presents the leading statistics of rolling mills and steel works, by states and territories, as reported at the censuses of 1880 and 1890.

COMPARATIVE STATEMENT, ROLLING MILLS AND STEEL WORKS, BY STATES AND TERRITORIES: 1880 AND 1890. (a)

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The United States	1880	358	$116,458,390	96,164	$41,880,687	$130,104,493	$203,274,042
	1890	395	b278,559,831	c110,537	c9,293,673	216,269,022	331,860,872
Alabama	1880	1	50,000	60	18,000	25,400	47,500
	1890	7	2,208,797	1,739	738,308	931,460	2,228,536
California	1880	1	1,000,000	319	177,722	535,500	780,000
	1890	4	4,656,611	1,152	749,849	1,938,333	3,097,155
Colorado	1880	1	100,000	125	7,000	131,700	225,000
	d1890						
Connecticut	1880	11	1,385,000	546	265,210	869,758	1,353,787
	1890	8	1,249,429	591	351,308	911,335	1,463,180
Delaware	1880	8	1,341,469	867	344,476	1,214,050	2,347,177
	1890	7	2,558,865	1,690	843,219	1,549,539	2,608,070
District of Columbia	1880	1	89,600	18	7,528	2,264	10,970
	1890						
Georgia	1880	1	250,000	500	102,229	373,270	486,760
	d1890						
Illinois	1880	13	4,845,620	4,755	2,323,664	13,214,536	18,153,439
	1890	19	24,834,645	7,433	4,571,046	21,951,521	28,872,741
Indiana	1880	9	1,828,000	1,740	810,081	2,957,467	4,090,868
	1890	13	3,888,254	2,644	1,215,792	2,889,615	4,505,536
Kansas	1880	2	450,000	630	166,500	734,245	1,004,100
	1890						
Kentucky	1880	9	2,512,000	2,205	914,412	2,422,389	3,841,377
	1890	5	1,484,456	1,205	628,658	1,241,536	2,059,840
Maine	1880	2	300,000	400	96,544	356,042	522,953
	d1890						
Maryland	1880	5	2,145,000	1,253	546,974	1,829,042	2,550,051
	1890	4	1,071,352	573	211,009	766,849	1,062,204
Massachusetts	1880	21	5,526,408	6,115	2,390,975	6,486,372	9,973,911
	1890	14	8,344,394	5,200	2,629,699	6,786,610	10,981,649
Michigan	1880	2	671,000	925	360,727	1,188,196	1,446,551
	1890	4	1,437,540	777	479,783	1,200,758	1,847,595
Missouri	1880	5	3,020,000	1,789	447,464	1,412,934	2,185,513
	1890	4	1,612,443	660	421,935	831,566	1,520,559
Nebraska	1880	1	100,000	100	50,000	114,500	82,000
	1890						
New Hampshire	1880	2	650,000	290	127,690	523,355	807,340
	d1890						
New Jersey	1880	18	5,005,550	3,495	1,412,622	3,914,970	6,704,054
	1890	19	8,525,996	4,627	2,514,404	5,326,401	8,756,431
New York	1880	24	8,702,000	7,437	2,725,191	8,264,186	13,924,622
	1890	19	9,321,793	5,418	2,872,316	5,932,461	10,310,088
Ohio	1880	41	9,805,020	11,127	5,539,913	14,848,295	21,880,167
	1890	55	25,892,350	19,942	12,069,542	28,854,636	45,406,560
Pennsylvania	1880	158	60,489,929	43,832	20,099,576	61,564,150	98,445,709
	1890	186	166,691,801	78,347	44,921,173	122,530,544	188,714,190
Rhode Island	1880	1	350,000	275	130,969	375,347	488,040
	d1890						
Tennessee	1880	5	1,401,000	1,350	376,786	859,965	1,369,400
	1890	4	927,549	481	249,529	492,789	881,404
Vermont	1880	1	300,000	165	48,000	227,100	367,500
	1890						
Virginia	1880	5	878,000	1,134	352,539	1,199,698	1,986,416
	1890	6	2,174,787	1,782	705,048	1,584,285	2,400,603
West Virginia	1880	8	2,390,191	3,228	1,301,658	2,726,014	4,422,936
	1890	8	5,012,842	3,409	1,639,276	6,402,189	8,547,360
Wisconsin	1880	1	700,000	1,300	647,577	1,729,274	3,284,556
	d1890						
Wyoming	1880	1	212,603	184	79,650	403,568	491,345
	d1890						
All other states	d1890	9	6,665,887	2,807	1,481,779	4,146,595	6,596,601

a This statement includes only active establishments.

b Includes hired property valued at $3,212,000. This item was not reported separately at the census of 1880.

c Includes 3,242 officers, firm members, and clerks and their wages, amounting to $4,833,240, distributed as follows: Alabama 43, $56,648; California 38, $56,549; Connecticut 29, $39,537 Delaware 53, $78,061 Illinois 168, $246,193 Indiana 63, $95,013 Kentucky 32, $46,651 Maryland 16, $16,823; Massachusetts 122, $175,664; Michigan 25, $44,444; Missouri 18, $28,039; New Jersey 129, $212,812; New York 127, $190,862; Ohio 453, $663,638 Pennsylvania 1,738, $2,564,584; Tennessee 21, $30,830; Virginia 40, $65,701 West Virginia 63, $86,687 All other states, including Colorado, Georgia, Iowa, Minnesota, Maine, New Hampshire, Rhode Island, Wisconsin, and Wyoming, 64, $125,499. These classes were not reported separately at the census of 1880.

d Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 1; Georgia, 1; Iowa, 1; Minnesota, 1; Maine, 1; New Hampshire, 1; Rhode Island, 1; Wisconsin, 1; Wyoming, 1.

CAPITAL.

The aggregate capital reported by rolling mills and steel works (including idle mills and those in course of construction) increased 98.67 per cent from 1870 to 1880 and 135.37 per cent from 1880 to 1890, the total increase in the 20 years amounting to 367.60 per cent.

The following comparative statement shows the distribution of capital in active and idle establishments and those in course of construction in rolling mills and steel works, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, ROLLING MILLS AND STEEL WORKS: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash, and bills receivable.
Total	1880	397	$121,424,745	$71,702,596	$49,722,149
	1890	440	a285,796,684	134,143,477	151,653,207
Establishments in operation	1880	358	116,458,390	69,033,147	47,425,243
	1890	395	278,559,831	128,623,160	149,936,671
Idle establishments	1880	33	4,064,355	2,534,449	1,529,906
	1890	34	5,711,693	4,366,017	1,345,676
Establishments in course of construction	1880	6	902,000	135,000	767,000
	1890	11	1,525,160	1,154,300	370,860

a Includes hired property valued at $3,212,000. Also hired property valued at $18,000 invested in idle establishments. This item was not reported separately at the census of 1880.

The statistics of live assets, such as cash, bills and accounts receivable, and similar items of capital, were more fully reported in 1890 than at previous census inquiries. The increase from 1880 to 1890 in the total capital invested by the rolling mills and steel works is shown by the above figures to have been 135.37 per cent, while the gain in the value of buildings, machinery, tools, and implements was 87.08 per cent. The value of land was not reported separately in 1880.

EMPLOYÉS AND WAGES.

The following statement presents the average number and total wages of officers or firm members and clerks, and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES, BY CLASSES, ROLLING MILLS AND STEEL WORKS: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	140,537	$79,293,673	138,327	$78,847,819	107	$43,806	2,103	$402,048
Officers or firm members	890	2,630,536	890	2,630,536	.....	.....	.....	.....
Clerks	2,352	2,202,704	2,303	2,176,004	49	26,700	.....	.....
Skilled	77,638	52,583,603	77,503	52,546,013	2	1,040	133	36,550
Unskilled	59,657	21,876,830	57,631	21,495,266	56	16,066	1,970	365,498

The following statement presents the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, ROLLING MILLS AND STEEL WORKS: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	135,134	58	2,103
Under $5	1,402	28	1,484
$5 and over but under $6	3,144	12	319
$6 and over but under $7	8,000	8	282
$7 and over but under $8	15,333	4	16
$8 and over but under $9	19,370	3	2
$9 and over but under $10	17,340	1	.....
$10 and over but under $12	17,827	2	.....
$12 and over but under $15	19,634	.....	.....
$15 and over but under $20	16,173	.....	.....
$20 and over but under $25	9,961	.....	.....
$25 and over	6,950	.....	.....

MATERIALS USED.

The following comparative statement presents the quantity and cost of the principal raw materials consumed by the rolling mills and steel works, as reported at the censuses of 1880 and 1890. With the exception of charcoal, which is stated in bushels, and of oil used for fuel, which is stated in barrels, the quantities given are in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, ROLLING MILLS AND STEEL WORKS: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Cost.	Quantity.	Cost.
Total	.....	$130,104,493	.....	$216,269,022
Iron ore	373,414	2,779,879	581,503	3,355,139
Spiegeleisen and ferro-manganese	86,138	2,868,519	248,536	7,588,784
Pig iron	2,558,522	59,000,257	6,299,999	97,758,067
Old iron rails	708,534	20,701,099	392,495	9,109,765
Other old or scrap iron	438,145	11,552,698	943,623	16,418,611
Old steel rails and steel rail ends	85,653	2,435,263	145,837	2,627,649
Other old or scrap steel	110,371	3,003,714	451,346	7,945,013
Hammered iron ore blooms	43,411	2,588,140	16,936	599,983
Hammered pig or scrap blooms	49,511	2,549,829	23,452	720,457
Purchased muck bar	53,754	2,369,544	234,678	6,252,594
Purchased bessemer steel	*a*52,155	*a*2,808,497	838,118	24,117,921
Purchased open-hearth steel	*b*24,993	*b*1,530,560	141,342	4,635,585
Swedish billets and bars	10,410	855,176	15,463	1,008,698
Anthracite coal	706,976	1,875,062	961,039	1,487,713
Bituminous coal	4,605,689	10,510,255	5,171,102	9,663,208
Coke	142,605	582,901	393,050	1,311,588
Charcoal	2,667,902	234,379	2,770,611	243,773
Oil for fuel	.....	.....	1,859,138	1,124,206
Natural gas	.....	.....	.....	3,566,946
All other materials	.....	1,858,721	.....	16,733,322

a Includes 9,216 tons other billets and bars, costing $507,509.
b Includes 7,280 tons other billets and bars, costing $400,898.

Scrap iron and scrap steel are largely used by the rolling mills and steel works. With the exception of old iron rails the consumption of scrap material has considerably increased since 1880, although not bearing the same ratio to the consumption of pig iron in 1890 as in 1880. The substitution of steel rails for iron rails in the tracks of the leading railroads of the country is gradually exhausting the supply of old iron rails, although the miles of railroad track in the United States still laid with iron rails in 1890 was about one-fifth of the total mileage.

FUEL CONSUMED.

The total expenditure for fuel in the heating and other operations connected with the manufacture of rolled and hammered iron and steel by the rolling mills and steel works amounted to $17,397,434 in 1890, and $13,202,597 in 1880. The consumption of anthracite coal increased from 706,976 tons in 1880 to 961,039 tons in 1890; of bituminous coal, from 4,605,689 tons to 5,171,102 tons; of coke, from 142,605 tons to 393,050 tons, and of charcoal, from 2,667,902 bushels to 2,770,611 bushels in 1890.

Since 1880 the use of natural gas for fuel exerted for a time an important influence on the manufacture of iron and steel in certain sections of the country. This fuel was employed as early as 1874 in puddling and heating furnaces in a rolling mill at Leechburg, Pa., but it was not until the discovery of the extensive gas fields in the vicinity of Murrysville, in Westmoreland county, Pennsylvania, in 1883, and the subsequent opening up of other wells in this county and in various parts of Washington county, that attention was prominently directed to the advantages of the new fuel in the manufacture of iron and steel. Following the developments in Pennsylvania wells were drilled in other states. The opening up in 1886 of the gas fields in northwestern Ohio, in Hancock county, and the subsequent discovery of deposits in eastern and central Indiana, led to the erection of numerous industrial establishments in these sections.

In 1880 the use of natural gas as fuel in iron and steel works was restricted to a few mills which obtained their supply from wells that had been driven for oil but developed gas. According to the records of the American Iron and Steel Association there were 6 rolling mills and steel works which used natural gas wholly or in part as fuel in September, 1884, which number increased to 68 in August, 1886; 96 in November, 1887, and 104 in November, 1889. In the census year, 1890, there were 85 rolling mills and steel works which reported the use of natural gas for fuel exclusively or in part. Of these works 68 were in Pennsylvania, 54 in Allegheny county, and 14 in the western part of the state outside of Allegheny county; 8 were in Ohio, 4 in the eastern part of the state, piped from wells in Pennsylvania, and 4 in the northwestern part of that state, supplied from local wells: 5 were at Wheeling and in its vicinity in West Virginia, and 4 were in Indiana.

During 1890 the cost of the natural gas used for fuel by iron and steel works was $3,566,946. This is the amount reported as expended by various mills for natural gas, but it is not the total value of this fuel consumed in iron and steel manufacture, as many plants in Ohio and Indiana were furnished with gas free as an inducement to the location of the works in the towns controlling the supply.

As early as 1889 the diminished pressure of gas at the various iron and steel plants indicated an early exhaustion of the supply, at least for purposes requiring the enormous quantity consumed by industrial establishments. The greatly increased rates charged for gas for manufacturing purposes by the companies controlling the supply led many iron and steel manufacturers to build private pipe lines to the gas fields. Even this course has failed in many instances to give the quantity of gas required for both steam raising and iron and steel making purposes, and many plants during 1890 used the natural gas for manufacturing processes while employing other fuel under the boilers.

No figures are available of the extent to which natural gas has displaced bituminous coal as a fuel in the manufacture of iron and steel. In 1890 many of the mills, which had during the few years prior to this date employed natural gas exclusively, returned in part to the use of coal. The following is a comparative statement of the consumption of bituminous coal in 1880 and 1890 by the states which used natural gas, with the cost of the latter fuel in 1890:

COMPARATIVE STATEMENT, FUEL CONSUMED IN STATES IN WHICH NATURAL GAS IS USED IN ROLLING MILLS AND STEEL WORKS: 1880 AND 1890.

STATES.	CONSUMPTION OF BITUMINOUS COAL. (Tons.)		COST OF NATURAL GAS CONSUMED.
	1880	1890	1890
Pennsylvania	2,214,939	1,727,403	$3,391,468
Ohio	676,084	1,459,482	151,403
Indiana	150,097	130,026	(a)
West Virginia	161,191	171,774	24,075

a Natural gas supplied free.

Pennsylvania, where most of the gas was consumed, exhibits a marked decrease in consumption of bituminous coal in the 10 years.

Numerous experiments have been made in recent years with various forms of gaseous fuel produced from coal or petroleum, but the cost has not been sufficiently favorable to result in the extended introduction of any of the processes suggested. One establishment in 1890 employed water gas, while numerous plants throughout the country have found a cheap and efficient fuel in the vast deposits of bituminous slack and anthracite culm at the

various coal mines, which had generally been considered as waste material by the mine owners. Crude oil was extensively employed in 1890 for fuel purposes, the ease with which the degree of heat may be regulated commending it favorably to the attention of iron and steel manufacturers. It was used either in special devices in the heating of iron or steel, or sprayed under boilers for steam raising purposes. The rolling mills and steel works made no report of the use of oil for fuel purposes in 1880, but the consumption in 1890 for heating and steam raising purposes amounted to 1,859,138 barrels, costing $1,124,206, or an average of a little over 60 cents per barrel.

PRODUCTS.

The following comparative statement presents the tonnage of the iron and steel products, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, QUANTITY OF PRODUCTS, ROLLING MILLS AND STEEL WORKS: 1880 AND 1890.

CLASS OF PRODUCTS.	1880	1890
Total	3,411,562	8,274,833
Iron	2,353,248	3,225,140
Bessemer steel	889,896	4,385,365
Open-hearth steel	93,143	590,198
Crucible and miscellaneous steel	75,275	74,130

The following comparative statement presents the values of the different iron and steel products and the percentage that each class bears of the total, for the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, VALUE OF PRODUCTS, WITH PERCENTAGE EACH CLASS IS OF TOTAL, ROLLING MILLS AND STEEL WORKS: 1880 AND 1890.

CLASS OF PRODUCTS.	VALUE.		PERCENTAGE.	
	1880	1890	1880	1890
Total	$203,274,042	$331,860,872	100.00	100.00
Manufactures of iron	135,400,462	132,620,665	66.61	39.96
Manufactures of steel	66,306,735	192,992,784	32.62	58.16
Miscellaneous products	1,566,845	6,247,423	0.77	1.88

The increase in the total tonnage of products from 1880 to 1890 was 142.55 per cent, while the value of products increased only 63.26 per cent. This disproportion is due to the decline which has taken place in the selling price of iron and steel products during the past decade, owing to improvement in processes of manufacture and lessened cost of materials. A comparison of the statistics of quantity of production shows more accurately the changes which have taken place in the industry than is possible by a comparison of the value of such products.

The most notable increase in the 10 years was in bessemer steel products, which contributed 53 per cent of the aggregate output in 1890 and 26.08 per cent in 1880. The increase in the tonnage of iron products was 37.05 per cent, although they formed 68.98 per cent of the total production in 1880 and only 38.97 per cent in 1890.

Owing to the decline since 1880 in the selling prices of iron and steel products, there is a decrease in the value of iron products of 2.05 per cent, notwithstanding an increase of 37.05 per cent in the tonnage. The percentage of increase in the value of all steel products was 191.06, as compared with an increase of 377.15 per cent in the tonnage of these articles. The comparative statement on the following page exhibits the classified tonnage and value of the iron and bessemer steel and open-hearth steel products of the rolling mills and steel works as reported at the censuses of 1880 and 1890. The quantities are stated in tons of 2,000 pounds, except for nails, which are reported in kegs of 100 pounds each.

COMPARATIVE STATEMENT, CLASSIFIED IRON AND BESSEMER STEEL AND OPEN-HEARTH STEEL PRODUCTS, ROLLING MILLS AND STEEL WORKS: 1880 AND 1890.

CLASS OF PRODUCTS.	Year.	IRON.		BESSEMER STEEL.		OPEN-HEARTH STEEL.	
		Tons.	Value.	Tons.	Value.	Tons.	Value.
Total	1880	.....	$135,400,462	.....	$47,495,585	.....	$8,166,685
	1890	.....	132,620,665	.....	150,655,612	.....	32,934,121
Rails	1880	466,917	20,978,697	741,475	37,408,625	9,105	463,450
	1890	15,361	622,224	2,076,325	60,272,575	.....	.....
Bars and rods, except wire rods	1880	808,837	44,605,564	125,774	8,513,594	44,430	3,577,521
	1890	1,304,115	50,048,590	340,257	12,864,136	116,657	5,654,689
Cut nails (kegs of 100 pounds)	1880	5,056,600	16,295,300	.....	.....	.....	.....
	1890	2,139,086	4,577,557	3,704,604	7,676,306	13,340	79,740
Boiler plates	1880	89,560	6,501,298	(a)	.....	(a)	.....
	1890	66,461	3,158,319	9,065	396,809	89,720	5,019,001
All other plates, except nail plates	1880	94,749	5,688,863	b1,475	148,144	b11,034	1,428,300
	1890	139,549	5,973,520	91,840	4,056,021	87,139	4,587,454
Sheets	1880	94,992	8,473,642	.....	.....	1,700	191,955
	1890	154,521	9,693,064	61,332	4,037,226	31,389	2,437,680
Skelp	1880	128,321	7,910,409	.....	.....	.....	.....
	1890	465,550	17,621,186	13,919	536,366	.....	.....
Hoop	1880	96,843	6,069,484	.....	.....	.....	.....
	1890	123,317	5,076,591	5,429	234,706	3,532	160,000
Structural shapes	1880	96,810	5,520,719	557	63,060	80	8,800
	1890	137,527	6,941,474	95,693	4,529,411	76,298	3,992,074
Rolled car axles	1880	2,630	179,154	.....	.....	.....	.....
	1890	1,500	67,500	.....	.....	1,000	60,000
Hammered car axles	1880	21,884	1,600,104	.....	.....	.....	.....
	1890	36,545	1,685,345	11,456	609,677	10,445	640,429
Muck bar for sale	1880	64,469	2,440,941	.....	.....	.....	.....
	1890	282,340	7,411,748	.....	.....	.....	.....
All other products	1880	c134,406	9,136,287	20,615	1,362,162	26,794	2,476,659
	1890	c391,400	19,743,547	1,494,819	55,442,379	173,351	10,303,054

a Included with "all other plates, except nail plates", in 1880.
b Includes "boiler plates".
c Includes billets and slabs sold, wire rods, wire and nail plates.

In the above statement, the tonnage of "Bars and rods, except wire rods", does not represent the total quantity of these articles rolled in each year. A number of works produce the bars or rods not for sale but for further manufacture by the same establishment into articles such as bolts, nuts, and spikes. In such instances the tonnage of the completed articles, and not the tonnage of the bars and rods from which they are made, is given, being included with "All other products".

While it has been the endeavor to confine the statistics of the rolling mills and steel producing works as closely as possible to the articles which are strictly the products of such processes of manufacture, there are instances similar to the above, and others which are elsewhere explained, where it has not been practicable for the owners of these establishments to divide all their interwoven operations and accounts so as to determine what part should be credited to the manufacture of bars and rods and what part to the more finished articles made from them. Consequently the capital, labor, materials, and products of such establishments are tabulated as a whole, as was done in 1880.

As previously explained, a number of iron and steel establishments sold muck bar and steel billets or slabs to other rolling mills for manufacture into more finished forms. To this extent there is an unavoidable duplication in the tonnage and value of products, the muck bar and steel billets sold and included in the table of products as the output of certain establishments being considered as materials of the works purchasing them, and appearing as the product of the second establishment in the form of bars, plates, nails, and other products.

During 1890 the bessemer steel works produced 4,051,262 tons of bessemer steel ingots, although the figures in the preceding table show that the aggregate output of bessemer steel finished products was 4,385,365 tons. The apparent discrepancy is due to the unavoidable duplication above referred to, the quantity of steel billets and slabs sold to other works being included in the table of products. In 1890 the iron and steel rolling mill establishments purchased from the steel producing works and rolled into finished forms 838,118 tons of bessemer steel billets and slabs.

The following comparative statement presents the total tonnage of the iron and steel products of the rolling mills and steel works, by states and territories, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, QUANTITY OF PRODUCTS, ROLLING MILLS AND STEEL WORKS, BY STATES AND TERRITORIES: 1880 AND 1890.

STATES AND TERRITORIES.	1880			1890		
	Total.	Iron.	Steel.	Total.	Iron.	Steel.
The United States	3,411,562	2,353,248	1,058,314	8,274,833	3,225,140	5,049,693
Alabama	650	650		52,205	50,550	1,655
California	14,000	14,000		56,747	39,303	17,444
Colorado	4,500	4,500		20,883	6,597	14,286
Connecticut	19,282	16,203	3,079	27,727	17,123	10,604
Delaware	33,918	33,918		58,437	57,913	524
District of Columbia	264	264				
Georgia	11,501	11,501		2,838	2,838	
Illinois	322,499	117,051	205,448	910,648	156,404	754,244
Indiana	77,880	77,880		110,201	73,731	36,470
Iowa				1,183	1,183	
Kansas	19,055	19,055				
Kentucky	65,643	65,293	350	49,082	36,711	12,371
Maine	8,851	8,851		10,300	10,300	
Maryland	47,609	47,609		20,222	8,479	11,743
Massachusetts	131,734	109,252	22,482	150,621	42,224	108,397
Michigan	23,130	23,130		40,588	33,478	7,110
Minnesota				2,565	2,565	
Missouri	26,708	16,508	10,200	27,708	25,208	2,500
Nebraska	2,000	2,000				
New Hampshire	7,978	4,752	3,226	6,650	3,450	3,200
New Jersey	82,617	66,030	16,587	157,276	89,818	67,458
New York	253,214	163,538	89,676	240,026	109,472	130,554
Ohio	381,429	272,094	109,335	1,128,013	571,334	556,679
Pennsylvania	1,661,784	1,071,098	590,686	4,770,976	1,705,202	3,065,774
Rhode Island	8,134	8,134		13,006	13,006	
Tennessee	28,126	25,381	2,745	20,651	20,521	130
Vermont	6,000	1,500	4,500			
Virginia	35,176	35,176		52,442	50,655	1,787
West Virginia	67,437	67,437		259,838	39,223	220,615
Wisconsin	60,653	60,653		74,695	48,547	26,148
Wyoming	9,790	9,790		9,305	9,305	

CRUDE STEEL.

The total production of steel in the United States in the form of ingots or direct castings during the census year 1890 amounted to 4,675,610 tons of 2,000 pounds, as compared with 1,150,667 tons produced during 1880, an increase of 3,524,943 tons, or 306.34 per cent. The comparative statement on the following page shows the production of the various kinds of steel in the form of ingots or direct castings, by states, as reported at the censuses of 1880 and 1890.

COMPARATIVE STATEMENT, QUANTITY OF CRUDE STEEL, INGOTS, OR DIRECT CASTINGS, ROLLING MILLS AND STEEL WORKS, BY STATES: 1880 AND 1890.

STATES.	AGGREGATE. (Tons.)		BESSEMER STEEL. (Tons.)		OPEN-HEARTH STEEL. (Tons.)		CRUCIBLE STEEL. (Tons.)		MISCELLANEOUS STEEL. (Tons.)	
	1880	1890	1880	1890	1880	1890	1880	1890	1880	1890
The United States	1,150,667	a4,675,610	985,208	a4 051,262	84,302	537,639	76,201	82,748	4,956	3,961
Alabama		300				300				
California		8,456				8,456				
Colorado		17,952		17,952						
Connecticut	2,200	1,743					2,116	1,743	84	
Illinois	254,569	873,551	253,514	870,775	925	2,331	130	445		
Indiana		1,250				1,000		250		
Kentucky	350				275		75			
Maryland		1,000						1,000		
Massachusetts	9,615	29,425		15,753	9,475	13,140	140	532		
Michigan		5,438		3,600				1,838		
Missouri	8,409		8,409							
New Hampshire	4,521	3,700			4,521	3,700				
New Jersey	11,942	23,687			450	15,554	10,492	7,433	1,000	700
New York	86,745	113,981	84,160	105,402		1,300	2,585	7,279		
Ohio	107,883	443,043	82,811	381,098	24,712	61,945	360			
Pennsylvania	657,433	2,971,270	556,314	2,476,018	36,944	429,913	60,303	62,078	3,872	3,261
Tennessee	4,000	150			4,000			150		
Vermont	3,000				3,000					
West Virginia		180,664		180,664						

a Including 77,632 tons of Clapp-Griffiths steel made in Illinois, Massachusetts, and Pennsylvania, and 4,884 tons of Robert-Bessemer steel made in Illinois, Michigan, and Pennsylvania.

During 1880 14 states contained steel making establishments, and steel was produced in that year in each of these states except Rhode Island and Maryland. In 1890 steel works were located in 19 states and steel was made in that year in each of these states except Kentucky, Missouri, and Virginia.

Pennsylvania continues to occupy the position of the leading producer of steel in the United States, producing 57.13 per cent of the total production in 1880 and 63.55 per cent in 1890. Illinois was second in rank in both years, and Ohio was third.

From 1880 to 1890 the increase in production in Pennsylvania was 351.95 per cent, in Illinois, 243.15 per cent, and in Ohio, 310.67 per cent. Since 1880 the manufacture of steel has been abandoned in 2 states, namely, Rhode Island and Vermont, and 7 states have engaged in its production, namely, Alabama, California, Colorado, Indiana, Michigan, Virginia, and West Virginia.

MACHINERY IN ROLLING MILLS AND STEEL WORKS.

The following comparative statement shows the equipment and capacity of the rolling mills and steel works, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, EQUIPMENT AND CAPACITY, ROLLING MILLS AND STEEL WORKS: 1880 AND 1890. (a)

MACHINERY.	1880	1890	Increase.
Single puddling furnaces	4,376	4,853	477
Heating furnaces	2,622	2,912	290
Bessemer converters	24	b97	73
Open hearth furnaces	37	129	92
Crucible pots which can be used at each heat	2,691	2,606	c85
Hammers	458	625	167
Cut nail machines	3,775	5,909	2,134
Trains of rolls	1,342	1,557	215
Aggregate daily capacity in finished products, net tons	22,098	46,565	24,467

a Includes machinery in both active and idle establishments.
b Includes 9 Clapp-Griffiths and 8 Robert-Bessemer converters.
c Decrease.

In addition to the increase in the number of bessemer converters and open-hearth steel melting furnaces from 1880 to 1890, the tendency during this period has been toward the employment of much larger vessels and furnaces. Except in a few instances where bessemer converters of 2 and 3 tons capacity have been added to iron rolling mills for special purposes, the old standard vessel of 5 tons capacity has been superseded in the larger works by

converters of from 10 to 12 tons capacity per heat. In one establishment bessemer converters of 15 tons capacity have been erected. The open-hearth furnaces in 1880 had a capacity ranging from 7 to 10 tons per heat, but in 1890 many works contained steel melting furnaces with a capacity of from 20 to 30 tons each.

The daily capacity of the rolling mills and steel works in tons of finished products has more than doubled since 1880. This great expansion has been largely due to the use of more extensive plants and greater efficiency in the handling of the improved machinery employed, although the substitution of steel for iron has contributed to this growth in an important degree, the rolling of steel insuring a larger output than is possible in the manufacture of iron products. The heavy output of bessemer steel works are not so much the result of greater rapidity in the completion of the various processes of manufacture as they are to the shorter period of idleness which is allowed to intervene between the completion of one operation and the beginning of another.

FORGES AND BLOOMERIES.

The manufacture of charcoal blooms and hammered bar iron direct from iron ore and of charcoal blooms from pig and scrap iron is rapidly succumbing to the competition of modern processes of iron and steel making, the industry in 1890 occupying an insignificant position as compared with its importance a decade or two ago.

In 1880 the establishments engaged in the manufacture of wrought iron direct from iron ore were located in 8 states, the works in Missouri, New Jersey, New York, and Pennsylvania producing blooms and billets, while those in Georgia, North Carolina, Tennessee, and Virginia made hammered bar iron. The forges in the southern states were of small size, usually containing 2 forge fires, and were able to produce in a day about 250 pounds of hammered bar iron to each fire. Many of these quaint iron making enterprises were to be found in the mountainous districts of eastern Tennessee and western North Carolina. They were operated only at irregular intervals, depending upon the wants of the neighboring blacksmiths, and also upon the supply of water in the mountain streams which furnished the power to operate the blast and hammer. The ancient "trompe" or water blast was employed by these works, furnishing a fairly steady blast for the forge fires. With the advent of railroads into these districts, bringing the cheaper products of more modern methods of manufacture, the necessity which called into existence these primitive works has passed away. One by one the forges have been abandoned and dismantled, and the industry in the southern states may be considered as practically extinct. Primitive as these forges were in character, the bar iron produced was of good quality, and the passage of these works from activity to idleness marks an important step in the progress and advancement of the iron and steel industry.

Of the production of charcoal blooms and billets from iron ore in 1880, New York contributed 83.92 per cent; Pennsylvania, 0.47 per cent; New Jersey, 1.39 per cent; and Missouri, 10.63 per cent. Since 1880 the decline in the prices of iron and steel products has led to the substitution of other forms of material for the products of these small enterprises, and the majority of the works which were active at that date have been abandoned. In 1890 New York was the only state producing wrought iron blooms made direct from iron ore, the forges being located in the Lake Champlain district, where an abundant supply of rich iron ore was obtainable. The product of these works consisted of charcoal blooms and billets, which were highly esteemed for use in the manufacture of plate and sheet iron and fine grades of steel.

Blooms from pig and scrap iron were made in 8 states in 1880, the larger part of the production of that year being the output of works in Pennsylvania, Maryland, New Jersey, and Virginia. These blooms were used in the manufacture of plate and sheet iron wire, and for other purposes requiring a high grade of material. The production of blooms from pig and scrap iron has also seriously felt the competition of the products of less costly processes of manufacture.

The following comparative summary presents the leading statistics relating to the forge and bloomery industry, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, FORGES AND BLOOMERIES: 1870, 1880, AND 1890. (a)

ITEMS.	1870 (b)	1880	1890
Number of establishments	82	93	20
Capital	$4,506,733	$3,915,213	$876,470
Miscellaneous expenses	(c)	(c)	$54,680
Average number of employés (aggregate)	2,902	2,939	486
Total wages	$1,195,964	$915,395	$216,374
Officers, firm members, and clerks	(d)	(d)	
Average number			15
Total wages			$17,309
All other employés	(d)	(d)	
Average number			471
Total wages			$199,065
Cost of materials used	$5,685,466	$2,546,915	$905,208
Value of products (e)	$7,647,054	$3,968,074	$1,183,494
Tons of products	110,808	72,557	34,775

a This statement includes only active establishments for the censuses of 1880 and 1890, such establishments were not reported separately at the census of 1870.

b See remarks in regard to the depreciated currency of 1870.

c Not reported.

d Not reported separately.

e Includes values for which tonnage was not reported.

The following comparative statement presents the leading statistics of the forges and bloomeries, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, FORGES AND BLOOMERIES, BY STATES: 1880 AND 1890. (a)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The United States	1880	93	$3,915,213	2,939	$915,395	$2,546,915	$3,968,074
	1890	20	876,470	b486	b216,374	905,208	1,183,494
Georgia	1880	3	11,800	49	5,835	16,635	37,200
	1890						
Maryland	1880	1	60,00	67	18,138	102,726	219,660
	c1890						
Massachusetts	1880	1	5,000	8	564	1,834	2,200
	1890						
Missouri	1880	3	228,600	165	60,000	151,500	200,000
	1890						
New Jersey	1880	7	114,000	123	30,187	152,643	209,095
	c1890						
New York	1880	20	2,214,000	1,489	471,331	964,421	1,478,356
	1890	9	517,434	154	61,050	279,503	356,843
North Caroliana	1880	9	199,400	63	7,907	11,792	41,085
	1890						
Pennsylvania	1880	26	978,000	660	243,436	1,027,805	1,556,809
Tennessee	1880	15	39,200	148	21,090	26,654	64,781
	1890						
Virginia	1880	8	65,213	167	56,907	90,905	158,888
	1890						
All other states	c1890	11	359,036	332	155,324	625,705	826,651

a This statement includes only active establishments.

b Includes 15 officers, firm members, and clerks and their wages, amounting to $17,309, distributed as follows: New York 7, $10,800; Pennsylvania, Maryland, and New Jersey 8, $6,509. These classes were not reported separately at the census of 1880.

c Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maryland 1, New Jersey 1, and Pennsylvania 9.

CAPITAL.

The following comparative statement shows the different items of capital in active and idle establishments in forges and bloomeries, as reported at the censuses of 1880 and 1890. There were no plants reported in course of construction.

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL, ACTIVE AND IDLE ESTABLISHMENTS, FORGES AND BLOOMERIES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	118	$4,395,963	$2,301,550	$2,094,413
	1890	32	1,074,970	462,500	612,470
Establishments in operation	1880	93	3,915,213	2,018,800	1,896,413
	1890	20	876,470	338,000	538,470
Idle establishments	1880	25	480,750	282,750	198,000
	1890	12	198,500	124,500	74,000

EMPLOYÉS AND WAGES.

The following statement shows the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, FORGES AND BLOOMERIES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					
	Aggregates.		Males above 16 years.		Children.	
	Average number	Total wages.	Number.	Wages.	Number	Wages
All classes	486	$216,374	483	$216,014	3	$360
Officers or firm members	11	16,100	11	16,100	.....	.....
Clerks	4	1,269	4	1,269	.....	.....
Skilled	317	150,943	317	150,943	.....	.....
Unskilled	154	48,122	151	47,762	3	360

The following statement presents the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF SKILLED AND UNSKILLED EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, FORGES AND BLOOMERIES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS	
	Males above 16 years.	Children
Total	468	3
Under $5	6	3
$5 and over but under $6	11	.....
$6 and over but under $7	35	.....
$7 and over but under $8	65	.....
$8 and over but under $9	58	.....
$9 and over but under $10	36	.....
$10 and over but under $12	113	.....
$12 and over but under $15	102	.....
$15 and over but under $20	42	.....

MATERIALS USED.

The following comparative statement presents the total quantity and cost of each class of materials consumed by the forges and bloomeries, as reported at the censuses of 1880 and 1890. With the exception of charcoal, which is reported in bushels, the quantities are given in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, FORGES AND BLOOMERIES: 1880 AND 1890.

CLASS OF MATERIAL.	1880		1890	
	Quantity.	Cost	Quantity.	Cost.
Total	.....	$2,546,915	.....	$905,208
Iron ore	79,610	531,540	18,807	110,587
Pig iron	38,113	945,375	8,227	145,867
Old scrap iron	8,933	215,576	24,000	359,777
Charcoal	13,014,361	812,615	4,056,435	270,082
Anthracite coal	340	1,220	398	946
Bituminous coal	1,613	4,298	1,300	3,300
Coke	6,055	31,241	1,405	5,604
All other materials	.....	5,050	.....	9,045

The production of wrought iron from ore has decreased from 37,633 tons in 1880 to 9,347 tons in 1890, while the production of blooms from pig and scrap iron has decreased from 34,924 tons in 1880 to 25,428 tons in 1890.

PRODUCTS.

The following comparative statement presents the production of the iron ore forges and pig iron and scrap iron bloomeries, as reported at the censuses of 1880 and 1890. The quantities are stated in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF PRODUCTS, FORGES AND BLOOMERIES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Tons.	Value.	Tons.	Value.
Total	.....	$3,968,074	.....	$1,183,494
Blooms and bar iron direct from iron ore	37,633	1,812,390	9,347	356,843
Blooms from pig and scrap iron	34,924	2,129,933	25,428	821,168
Other products	.....	25,761	.....	5,483

In 1870 there were produced 110,808 tons of charcoal blooms and hammered bar iron.

MACHINERY.

The following comparative statement presents the equipment and total daily capacity of the forges and bloomeries, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, EQUIPMENT AND TOTAL DAILY CAPACITY, FORGES AND BLOOMERIES: 1880 AND 1890.

ITEMS.	1880	1890	Decrease.
Number of fires	495	202	293
Number of hammers	141	39	102
Total daily capacity, in tons of blooms, billets, or bars	520	295	225

THE INDUSTRY CONSIDERED GEOGRAPHICALLY.

In the presentation of the iron and steel industry of the various sections of the United States, the states may be regarded as comprising four grand divisions: the New England states; the middle states, including New York, New Jersey, Pennsylvania, and Delaware; the southern states, including the iron making states of Maryland, Virginia, West Virginia, North Carolina, Georgia, Alabama, Kentucky, Tennessee, and Texas; and the western states, including all states west of Pennsylvania not included in any of the other grand divisions.

The following comparative summary presents the leading statistics of the iron and steel industry by totals of these grand divisions, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, IRON AND STEEL INDUSTRY, BY GEOGRAPHICAL DIVISIONS: 1880 AND 1890. (*a*)

GEOGRAPHICAL DIVISIONS.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products. (*b*)	Tonnage of products.
				Employés.	Wages.			
The United States	*c*1880	792	$209,904,965	*d*140,798	*d*$55,451,510	$191,271,150	$296,557,085	7,265,140
	1890	719	*e*414,044,844	*f*175,506	*f*95,736,192	327,272,845	478,687,519	18,216,215
New England states	1880	49	10,490,408	8,654	3,357,911	9,516,570	14,558,627	212,980
	1890	32	13,224,150	6,844	3,521,475	9,286,050	15,105,441	242,639
Middle states	1880	440	122,814,213	75,055	31,348,225	113,432,592	180,484,560	4,492,746
	1890	390	256,833,069	108,592	59,914,027	199,225,674	294,048,406	10,613,053
Southern states	1880	130	21,942,311	19,728	5,916,868	13,739,624	23,006,074	615,235
	1890	109	43,051,652	17,601	7,669,000	27,047,767	39,982,152	2,297,184
Western states	1880	173	44,658,033	37,361	14,828,506	54,580,364	78,508,424	1,944,179
	1890	188	100,935,973	42,469	24,631,090	91,713,354	129,551,520	5,063,339

a This statement includes only active establishments.

b Includes values for which tonnage was not reported.

c For explanation of the apparent discrepancies in the data for 1880 see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

d Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota and included in the totals published at the census of 1880. These employés were engaged in making repairs to plant.

e Includes hired property valued at $8,273,058, distributed as follows: New England states, $115,000; middle states, $3,188,000; southern states, $1,283,000, western states, $3,687,058. This item was not reported separately at the census of 1880.

f Includes 4,325 officers, firm members, and clerks, and their wages, amounting to $6,462,236, distributed as follows: New England states 199, $297,157; middle states 2,484, $3,747,602; southern states 550, $806,415; western states 1,092, $1,611,062. These classes were not reported separately at the census of 1880.

NEW ENGLAND STATES.

In 1880 each of the New England states contained establishments engaged in the manufacture of iron and steel, but in 1890 this industry is reported in but 5 of these states. The 4 establishments in Vermont engaged in the manufacture of iron and steel in 1880 have been abandoned.

The following comparative summary presents the leading statistics relating to the iron and steel industry in the New England states, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, IRON AND STEEL INDUSTRY IN THE NEW ENGLAND STATES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880 (*b*)	1890
Number of establishments	48	49	32
Capital	$5,900,000	$10,490,408	*c*$13,224,150
Miscellaneous expenses	(*d*)	(*d*)	$413,578
Average number of employés	3,815	8,654	6,844
Total wages	$2,168,719	$3,357,911	$3,521,475
Officers, firm members, and clerks:			
Average number	(*e*)	(*e*)	199
Total wages			$297,157
All other employés:			
Average number	(*e*)	(*e*)	6,645
Total wages			$3,224,318
Cost of materials used	$7,338,150	$9,518,570	$9,286,050
Value of products	*f*$10,824,603	$14,558,627	$15,105,441
Tons of products	134,529	212,980	242,639

a This statement includes only active establishments for the censuses of 1880 and 1890; such establishments were not reported separately at the census of 1870.

b For explanation of the apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.

c Includes hired property, valued at $115,000. This item was not reported separately at previous censuses.

d Not reported.

e Not reported separately.

f Includes values for which tonnage was not reported.

Notwithstanding the decrease shown in the number of establishments in 1890 as compared with 1880, there has been an increase in the amount of capital and in the value of products. It is proper, however, to state in this connection, that the growth of the New England iron and steel industry during the past 20 years, as shown by a comparison of the total value of products in 1870, 1880, and 1890, is due mainly to the development of a single concern engaged in the manufacture of the more highly finished products of iron and steel.

The following comparative statement presents the leading statistics of the iron and steel industry of each of the New England States, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, IRON AND STEEL INDUSTRY IN THE NEW ENGLAND STATES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The New England States	*b*1880	49	$10,490,408	8,654	$3,357,911	$9,518,570	$14,558,627
	1890	32	*c*13,224,150	*d*6,844	*d*3,521,475	9,286,050	15,105,441
Connecticut	1880	17	2,557,000	685	331,184	1,341,225	1,998,098
	1890	13	2,189,521	690	418,189	1,324,078	2,037,618
Maine	1880	3	450,000	700	141,494	380,511	583,328
	*e*1890						
Massachusetts	1880	24	6,163,408	6,513	2,576,539	6,657,232	10,288,921
	1890	15	9,005,555	5,337	2,652,039	6,951,018	11,201,149
New Hampshire	1880	2	650,000	290	127,690	523,355	807,340
	*e*1890						
Rhode Island	1880	1	350,000	275	130,969	375,347	488,040
	*e*1890						
Vermont	1880	2	320,000	191	50,035	240,900	392,300
	1890						
All other states	*e*1890	4	2,029,074	817	451,247	1,010,954	1,866,674

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Includes hired property valued at $115,000. This item was not reported separately at the census of 1880.

d Includes 199 officers, firm members and clerks, and their wages amounting to $297,157, distributed as follows: Connecticut 41, $55,784; Massachusetts 127, $182,964; all other states 31, $58,409. These classes were not reported separately at the census of 1880.

e Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maine, 2; New Hampshire, 1; and Rhode Island, 1.

CAPITAL.—The following comparative statement shows the different items of capital in active and idle establishments in the iron and steel industry in the New England states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS, IRON AND STEEL INDUSTRY IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash, and bills receivable.
Total	1880	61	*a*$11,560,408	$6,305,435	$5,254,973
	1890	35	*b*13,415,450	4,958,545	8,456,905
Establishments in operation	1880	49	10,490,408	5,700,435	4,789,973
	1890	32	13,224,150	4,830,545	8,393,605
Idle establishments	1880	12	1,070,000	605,000	465,000
	1890	3	191,300	128,000	63,300

a See remarks in regard to inclusion of capital relating to mining and other operations in the figures for 1880.

b Includes hired property valued at $115,000. This item was not reported separately at the census of 1880.

BLAST FURNACES.

During the census year 1890 there were produced by the blast furnaces of New England 34,335 net tons of pig iron, valued at $886,438, as compared with 30,957 net tons of pig iron, valued at $1,020,896, reported at the census of 1880. In 1890 the pig iron industry of New England, including active and idle establishments, was confined to Maine, Massachusetts, and Connecticut; Maine contained 1 establishment with 1 furnace, Massachusetts contained 2 establishments with 4 furnaces, and Connecticut contained 7 establishments with 9 furnaces. The pig iron industry of Massachusetts and Connecticut is located in the western parts of these states, in what is known as the Salisbury district, charcoal constituting the fuel used in the furnaces. The iron manufactured is consumed chiefly in the manufacture of car wheels, for which purpose it is especially adapted.

The following comparative summary presents the leading statistics of the blast furnace industry of the New England states, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, BLAST FURNACES IN THE NEW ENGLAND STATES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880 (*b*)	1890
Number of establishments	13	10	7
Capital	$1,565,000	$1,974,000	$1,751,253
Miscellaneous expenses	(*c*)	(*c*)	$110,073
Average number of employés (aggregates)	613	855	216
Total wages	$437,035	$288,959	$100 581
Officers, firm members, and clerks:			
Average number	(*d*)	(*d*)	18
Total wages			$24,547
All other employés:			
Average number	(*d*)	(*d*)	198
Total wages			$76,034
Cost of materials used	$1,202,031	$677,862	$634,052
Value of products	$1,737,350	$1,042,896	$886,438
Tons of products	34,471	30,957	34,325

a This statement includes only active establishments for the censuses of 1880 and 1890. Such establishments were not reported separately at the census of 1870.
b For explanation of the apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.
c Not reported. *d* Not reported separately. *e* Includes values for which tonnage was not reported.

CAPITAL.—The following statement shows the different items of capital in active and idle establishments in blast furnaces in the New England states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS, BLAST FURNACES IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL. Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	14	*a*$2,149,000	$426,500	$1,722,500
	1890	10	1,942,553	689,794	1,261,759
Establishments in operation	1880	10	1,974,000	376,500	1,597,500
	1890	7	1,751,253	552,794	1,198,459
Idle establishments	1880	4	175,000	50,000	125,000
	1890	3	191,300	128,000	63,300

a See remarks in regard to the inclusion of capital relating to mining and other operations in the figures for 1880.

Of the 4 establishments that have been abandoned since 1880, 1 was located in Vermont, 2 were in Massachusetts, and 1 was in Connecticut.

EMPLOYÉS AND WAGES.—It is impracticable to make a correct comparison of the number of employés and wages for blast furnaces in 1880 and 1890; the figures for 1880, as previously explained, often including not only the labor directly employed at the furnaces, but also the labor engaged in mining and other operations conducted in direct connection with these establishments.

The following statement presents the average number and total wages of officers or firm members and clerks, and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, BLAST FURNACES IN THE NEW ENGLAND STATES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (Males above 16 years.) Employés.	Wages.
All classes	216	$100,581
Officers or firm members	11	18,500
Clerks	7	6,047
Skilled	76	32,948
Unskilled	122	43,086

The following statement shows the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, BLAST FURNACES IN THE NEW ENGLAND STATES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	Average number of employés. (Males above 16 years.)	WEEKLY RATES OF WAGES.	Average number of employés. (Males above 16 years.)
Total	198	$9 and over but under $10	63
		$10 and over but under $12	37
Under $5		$12 and over but under $15	7
$5 and over but under $6	2	$15 and over but under $20	1
$6 and over but under $7	3	$20 and over but under $25	
$7 and over but under $8	38	$25 and over	6
$8 and over but under $9	41		

During the census year 1890 the blast furnaces of New England were in operation an average of 8 months each, and the average term of employment for labor was 9 months. Furnace employés worked 12 hours per day, 7 days each week; yard hands worked 10 hours daily for 6 days of the week.

MATERIALS USED.—The following comparative statement presents the quantities and cost of the materials consumed by the blast furnaces of the New England states, as reported at the censuses of 1880 and 1890. Quantities are stated in tons of 2,000 pounds, except charcoal, which is reported in bushels.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, BLAST FURNACES IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF MATERIAL.	1880		1890	
	Quantities.	Cost.	Quantities.	Cost.
Total		$677,862		$634,052
Iron ore	73,019	345,361	75,698	268,880
Fluxing materials	12,604	11,033	11,168	10,330
Anthracite coal	5,900	23,240		
Charcoal	2,955,827	295,292	3,691,504	354,388
Mill cinder	132	2,936	45	454

PRODUCTS.—The following comparative statement presents the quantity and value of pig iron, including castings direct from the furnace, according to fuel used, produced by the blast furnaces of the New England states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF PRODUCTS CLASSIFIED ACCORDING TO KIND OF FUEL USED, BLAST FURNACES IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Tons.	Value.	Tons.	Value.
Total		$1,042,896		$886,438
Charcoal pig iron	26,554	888,836	34,335	886,438
Anthracite pig iron	4,403	132,060		
Total tonnage and value	30,957	1,020,896	34,335	886,438
All other products		22,000		

ROLLING MILLS AND STEEL WORKS.

The census of 1880 credited the New England states with 35 iron rolling mills, 5 open-hearth steel works, and 4 crucible steel works. In 1890 there were 25 rolling mills and steel works, of which 16 were iron and steel rolling mills not connected with steel producing works, and 9 establishments were equipped for the manufacture of crude steel. The 9 steel making establishments comprised 3 bessemer steel plants (one of which was Clapp-Griffiths), 3 open-hearth steel plants, 4 crucible plants, and 1 blister steel plant. One establishment contained both bessemer and open-hearth steel plants, and one made both crucible and blister steel. With the exception of one establishment all the works contained trains of rolls.

Establishments engaged in the manufacture of rolled iron or steel were reported in all the New England states at the census of 1880, and in 1890 each state, except Vermont, contained rolling mills or steel works which were in operation at some time during the year, although the business of several of the establishments was confined chiefly to the working of material furnished by their customers.

The following comparative summary presents the leading statistics relating to rolling mills and steel works in the New England states, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870	1880	1890
Number of establishments	34	38	25
Capital	*b*$4,338,000	$8,511,408	*c*$11,472,897
Miscellaneous expenses	(*d*)	(*d*)	$303,505
Average number of employés (aggregate)	3,195	7,791	6,628
Total wages	$1,728,684	$3,068,388	$3,420,894
Officers, firm members, and clerks:			
Average number	(*e*)	(*e*)	181
Total wages			$272,610
All other employés:			
Average number	(*e*)	(*e*)	6,447
Total wages			$3,148,284
Cost of materials used	$6,124,919	$8,838,874	$8,651,998
Value of products (*f*)	$9,070,253	$13,513,531	$14,219,003
Tons of products	99,808	181,979	208,304

a This statement includes only active establishments for the censuses of 1880 and 1890. Such establishments were not reported separately at the census of 1870.
b See remarks in regard to the depreciated currency of 1870.
c Includes hired property valued at $115,000. This item was not reported separately at previous censuses.
d Not reported.
e Not reported separately.
f Includes values for which tonnage was not reported.

The following comparative statement presents the leading statistics relating to rolling mills and steel works in the New England states, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The New England states	1880	38	$8,511,408	7,791	$3,068,388	$8,838,874	$13,513,531
	1890	25	*b*11,472,897	*c*6,628	*c*3,420,894	8,651,998	14,219,003
Connecticut	1880	11	1,385,000	546	265,210	869,758	1,353,787
	1890	8	1,249,429	561	351,308	911,335	1,463,180
Maine	1880	2	300,000	400	96,544	356,942	522,953
	*d*1890						
Massachusetts	1880	21	5,526,408	6,115	2,399,975	6,486,372	9,973,911
	1890	14	8,344,394	5,290	2,629,099	6,786,610	10,981,619
New Hampshire	1880	2	650,000	290	127,690	523,355	807,340
	*d*1890						
Vermont	1880	1	300,000	165	48,000	227,100	367,500
	1890						
Rhode Island	1880	1	350,000	275	130,969	375,347	488,040
	*d*1890						
All other states	*d*1890	3	1,879,074	777	439,887	954,053	1,774,174

a This statement includes only active establishments.
b Includes hired property valued at $115,000. This item was not reported separately at the census of 1880.
c Includes 181 officers, firm members, and clerks, and their wages, amounting to $272,610, distributed as follows: Connecticut 20, $39,537; Massachusetts 122, $175,664; all other states 30, $57,409. These classes were not reported separately at the census of 1880.
d Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maine, 1; New Hampshire, 1; Rhode Island, 1.

CAPITAL.—The following statement shows the different items of capital in active and idle establishments in rolling mills and steel works in the New England states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash, and bills receivable.
Total	1880	44	$9,316,408	$5,800,435	$3,515,973
	1890	25	a11,472,897	4,277,751	7,195,146
Establishments in operation	1880	38	8,511,408	5,320,435	3,190,973
	1890	25	11,472,897	4,277,751	7,195,146
Idle establishments	1880	6	805,000	480,000	325,000
	1890				

a Includes hired property valued at $115,000. This item was not reported separately at the census of 1880.

Of the 38 active and 6 idle establishments that were in existence at the census of 1880, 17 were abandoned before the census of 1890. There is an apparent discrepancy in this statement of 2 establishments, which is accounted for by the fact that in 1880 where a rolling mill was operated in connection with a steel plant the works were tabulated as 2 establishments. In 1890 works consisting of a rolling mill and steel plant have been considered as 1 establishment.

The 17 establishments reported at the Tenth Census, and since abandoned, represented an invested capital of $2,932,000, reported 2,262 employés and wages amounting to $763,599, and produced various manufactures of iron and steel valued at $3,759,499. There were erected during the decade 2 other establishments which have also been abandoned, and do not appear in the census reports for either period. Several of the establishments which have continued in operation have abandoned portions of their plant and are now running on a smaller scale than formerly.

The increase of capital shown in the foregoing table is due in a great measure to the form of inquiry used in 1890, which tended to develop more fully the true amount of capital.

EMPLOYÉS AND WAGES.—The following statement presents the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	6,628	$3,420,894	6,509	$3,390,302	43	$13,212	76	$17,380
Officers or firm members	46	115,866	46	115,866				
Clerks	135	156,744	134	156,224	1	520		
Skilled	3,703	2,031,398	3,645	2,017,398			58	14,000
Unskilled	2,744	1,116,886	2,684	1,100,814	42	12,692	18	3,380

The following statement presents the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	6,329	42	76
Under $5	46	15	48
$5 and over but under $6	149	12	21
$6 and over but under $7	362	8	7
$7 and over but under $8	657	4	.....
$8 and over but under $9	1,305	3	.....
$9 and over but under $10	1,259	.....	.....
$10 and over but under $12	889	.....	.....
$12 and over but under $15	787	.....	.....
$15 and over but under $20	541	.....	.....
$20 and over but under $25	205	.....	.....
$25 and over	129	.....	.....

The rolling mills and steel works of the New England states were in operation an average of 10 months during the census year 1890. The average term of employment for men was 11 months, for women 12 months, and for children 10.5 months.

In 3 mills 9 hours constituted the day of labor, and in the remaining establishments the men worked 10 hours per day (6 days per week) throughout the year. In 1880 the rolling mills and steel works of this section employed 7,791 hands, and were in operation an average of 9.75 months during the year.

MATERIALS USED.—The following comparative statement presents the quantities and cost of materials used by the rolling mills and steel works of the New England states, as reported at the censuses of 1880 and 1890. Quantities are stated in tons of 2,000 pounds, except oil, stated in barrels, and charcoal, which is stated in bushels.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED IN ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantities.	Cost.	Quantities.	Cost.
Total	.....	$8,838,874	.....	$8,651,998
Iron ore	20,212	141,154	2,277	14,931
Spiegeleisen and ferro-manganese	855	21,500	623	44,511
Pig iron	56,918	1,352,553	17,565	359,661
Old iron rails	36,503	1,048,414	26,279	655,762
Other old or scap iron	78,267	2,108,820	71,939	1,168,528
Old steel rails	1,400	35,000	2,668	50,692
Other old or scrap steel	5,008	156,759	20,145	343,531
Hammered iron ore blooms	8,187	435,150	170	7,200
Hammered pig or scrap blooms	2,226	89,010	.....	.....
Purchased muck bar	4,648	285,801	9	243
Purchased bessemer steel	16,600	964,000	82,284	2,446,782
Purchased open-hearth steel	a3,690	a278,700	10,825	365,207
Swedish billets or bars	565	39,280	1,596	109,080
Anthracite coal	44,095	200,046	16,829	81,702
Bituminous coal	213,055	1,037,413	186,900	760,288
Coke	3,545	10,410	5,350	35,571
Charcoal	673,786	50,113	919,303	76,289
Oil used for fuel	.....	.....	2,160	3,510
All other materials	.....	584,751	.....	2,128,510

a Includes 250 tons "other billets and bars", costing $12,500.

While the consumption of old scrap iron of all kinds has not varied greatly in the two census years, there is shown a considerable decrease in the quantity of pig iron used. Most of the pig iron consumed in 1880 was used by the rolling mills in the production of the various iron products, while in 1890 almost the entire quantity was converted into steel. The most notable increase in the consumption of materials in 1890, as compared with 1880, was in purchased bessemer steel.

PRODUCTS.—The following comparative statement presents the tonnage of rolled and hammered iron and steel products, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, QUANTITY OF PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880	1890
Total	181,979	208,304
Iron	148,692	86,103
Bessemer steel	16,406	93,746
Open-hearth steel	14,676	25,702
Crucible steel	2,205	2,753

The following comparative statement presents the values of the different iron and steel products and the percentage that each class bears of the total, for the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, VALUE OF PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	VALUE.		PERCENTAGE.	
	1880	1890	1880	1890
Total	$13,513,531	$14,219,003	100.00	100.00
Manufactures of iron	9,610,982	4,177,051	71.12	29.38
Manufactures of steel	3,376,883	7,863,514	24.99	55.30
Miscellaneous products	525,666	2,178,438	3.89	15.32

The total value of all iron and steel products of the rolling mills and steel works in the New England states was $13,513,531 in 1880 and $14,219,003 in 1890. The value of the manufactures of iron in 1880 was $9,610,982 and constituted 71.12 per cent of the total value of all products, while in 1890 the value of the iron manufactures was $4,177,051 and formed 29.38 per cent of the total value of all products. The value of the manufactures of steel increased from $3,376,883 in 1880 to $7,863,514 in 1890, constituting 24.99 per cent of the total value of all products in 1880, and 55.30 per cent in 1890. The value of all other products was $525,666 and $2,178,438 for 1880 and 1890, respectively, and the percentage of the total value of all products was 3.89 per cent in 1880 and 15.32 per cent in 1890.

The following comparative statement presents the tonnage and value of classified products of the rolling mills and steel works of the New England states, so far as they can be separately enumerated. All quantities are stated in tons of 2,000 pounds, except nails, which are reported in kegs of 100 pounds.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF CLASSIFIED PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Quantities.	Value.	Quantities.	Value.
Total	.....	$13,513,531	.....	$14,219,003
Iron:				
Rails	7,100	368,000	.....	.....
Bar and rod	65,239	4,218,239	47,407	1,876,352
Hoop	4,358	252,062	.....	.....
Skelp	7,163	504,513	.....	.....
Structural shapes	.....	.....	600	24,000
Plates, except nail plate	25,389	1,506,461	.....	.....
Hammered car axles	1,370	92,440	.....	.....
Cut nails	495,360	1,789,929	116,840	260,624
All other finished products	13,305	879,338	32,254	2,016,075
Steel, bessemer:				
Rails	1,500	112,500	.....	.....
Bar and rod	14,906	1,500,000	1,070	56,500
Plates, except nail plate	.....	.....	12,255	534,480
Cut nails	.....	.....	100,719	227,084
All other finished products	.....	.....	75,385	4,960,862

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF CLASSIFIED PRODUCTS, ETC.—Continued.

CLASS OF PRODUCTS.	1880		1890	
	Quantities.	Value.	Quantities	Value.
Steel, open-hearth:				
Rails	3,000	$195,000		
Bar and rod	3,938	355,600	7,335	$370,000
Plates	3,578	472,260	2,700	168,000
All other finished products	4,160	422,600	15,667	1,076,414
Steel, crucible:				
Finished products	2,205	318,923	2,753	470,174
All other products		525,666		2,178,438

In order to avoid disclosing the operations of individual establishments, it has been necessary to group a considerable portion of the products under the heads of "All other" iron, bessemer or open-hearth steel products, inasmuch as several important items among the products are made only by a single concern, and to enumerate these items would reveal the identity of the establishment.

The quantities of bars and rods stated exclude all bars and rods manufactured into bolts, nuts, and other products by the same establishment, the quantities and values of these finished products being stated as "all other products".

The rod iron reported for 1880 probably included the quantity and value of all wire rods produced. This item for 1890 includes only rod iron sold in that form. The larger part of the wire rods produced in 1890 was drawn into wire and sold in the form of wire or manufactures of wire. The steel wire rods, of which a large quantity was rolled in New England in 1890, were also largely finished into wire and other products at the works where they were rolled. As the rods so consumed were only an intermediate product, and almost exclusively the output of a single establishment, they are not given separately; the quantity and value of the finished products made therefrom, together with the rods sold to other works for the manufacture of screws, rivets, and other finished forms, appear as "All other" bessemer, open-hearth, and crucible products. The items of "All other" iron, bessemer and open-hearth steel products, also include nail plate produced for sale, billets, car wheels, forgings, and car springs, which were manufactured by the rolling mills and steel works. All Clapp-Griffiths steel products are included with bessemer steel.

The quantities and values of finished steel products include all articles made either from steel produced by the steel works of this section, or from purchased steel billets, slabs, or bars. In addition to the large quantity of steel that was obtained from outside sources, and consumed by the rolling mills and steel works, the bessemer steel works of the New England states produced 15,753 net tons of ingots during the census year 1890, and the open-hearth steel works made 16,840 net tons of ingots, all of which was worked into finished forms and so reported in the foregoing statement. At the census of 1880, the open-hearth steel works of this section reported 16,996 net tons of ingots. No steel ingots were made in the New England states by the bessemer process in that year. The crucible steel works reported a production of 2,275 net tons of ingots, or direct castings, at the census of 1890, and 2,256 net tons at the census of 1880.

Several of the iron and steel rolling mills also roll copper and brass, and the value of these products, together with the amounts received from sales of roll scale, cinder, scrap, and other by-products, is given under the head of "Value of all other products".

MACHINERY.—The following statement shows the equipment of the rolling mills and steel works of the New England states and the increase or decrease of the same, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, EQUIPMENT AND CAPACITY, ROLLING MILLS AND STEEL WORKS IN THE NEW ENGLAND STATES: 1880 AND 1890. (*a*)

MACHINERY.	1880	1890	Increase.	Decrease.
Single puddling furnaces	220	48	.....	172
Heating furnaces	302	162	.....	140
Bessemer converters	.....	5*b*	5	.....
Open hearth furnaces	7	3	.....	4
Crucible pots, which can be used at each heat	202	188	.....	14
Hammers	49	39	.....	14
Cut nail machines	801	311	.....	490
Trains of rolls	134	77	.....	57
Aggregate daily capacity in finished products (net tons)	1,200	1,448	248	.....

a Includes machinery in both active and idle establishments.
b Includes 1 Clapp-Griffiths converter.

Although the returns show that there are 48 puddling furnaces in the rolling mills and steel works of the New England states, it should be explained that the greater number of these furnaces were idle during the census year 1890. Only 2 of the rolling mills puddled pig iron during that year, the total quantity thus worked being less than 2,000 net tons. It appears that 3 mills worked cast scrap iron in their puddling furnaces, nearly 14,000 net tons of this material being thus consumed. The remaining mills rolled their iron products from wrought scrap almost exclusively, a small amount of imported Swedish billets and purchased muck bar being used.

Notwithstanding the decrease shown in the number of heating furnaces and trains of rolls reported for 1890 as compared with 1880, there is an increase in the daily capacity of finished products. This is explained by the fact that many of the works which formerly produced their finished products from pig iron now use scrap iron, rendering a larger output possible, while at the same time a considerable quantity of finished steel is rolled from purchased billets or slabs.

The decline in the iron rolling mill industry of New England has been due chiefly to conditions peculiar to locality rather than to causes affecting the industry at large. The rapid growth of the iron and steel industry in other sections of the country, where pig iron and fuel can be obtained at much lower cost, has gradually narrowed the market of most of the New England iron mills to the limits of local demand, and even much of this trade has been absorbed by manufacturers in more favored localities. The natural resources that are required for the profitable operation of rolling mills and steel works are lacking in New England. There is no local supply of either fuel or pig iron. Although considerable pig iron is made in Massachusetts and Connecticut, the entire product is used for foundry purposes. The small quantity of pig iron that is consumed by the New England rolling mills and steel works is brought from other sections of the country, and all the coal and coke is similarly obtained. At the present time scrap iron constitutes the chief dependence of the rolling mills of New England, and this is the only raw material of which there is a local supply, the railroads and diversified manufacturing industries furnishing it in considerable quantity.

The rapid progress that has been made in this country in the manufacture of steel, the cheapening of the product, and its consequent substitution for iron for many uses have been important factors in the decline of the iron rolling mill industry of New England. The conditions in New England being generally unfavorable for the economical manufacture of the crude forms of steel, most of the iron manufacturers have been reluctant to assume the risks attendant upon the establishment of steel plants in connection with their works to meet the increasing demand for this class of material, preferring to depend upon a supply of crude steel obtained from works more advantageously located in other sections of this country or from abroad. The rerolling of imported Norway and Swedish iron was formerly an important branch of the iron industry of New England, but within the past decade it has dwindled to small proportions, owing chiefly to the substitution of steel for uses to which this class of iron was formerly applied.

FORGES AND BLOOMERIES.

At the census of 1880 there were reported 3 establishments in the New England states equipped for the manufacture of blooms from iron ore and from pig and scrap iron. The total capital invested in these works amounted to $95,000. The 1 establishment in operation reported a capital of $5,000, employed 8 hands, paying $564 in wages during the year, expended $1,834 for materials, and produced blooms valued at $2,200. Since 1880 2 establishments were built in this section, but at the census of 1890 all of these works were idle and considered by their owners as abandoned iron making plants.

MIDDLE STATES.

The prominent position occupied by the middle group of states, comprising Delaware, New Jersey, New York, and Pennsylvania, in the manufacture of iron and steel, is largely due to the growth of the industry in Pennsylvania. The extension of the manufacture of iron and steel in the southern and western sections of the country has not deprived this state of its leadership in the production of crude and finished forms of products. In 1890 it produced 49.13 per cent of the total quantity of pig iron made in the United States during that year; 52.87 per cent of the finished iron products; 61.12 per cent of the bessemer steel ingots; 69.17 per cent of the bessemer steel rails; 79.96 per cent of the open-hearth steel ingots; 75.02 per cent of the crucible steel ingots, and 53.02 per cent of the total tonnage of all iron and steel products. The manufacture of iron and steel in New Jersey and New York exhibited a larger and more general expansion from 1870 to 1880 than from 1880 to 1890, and in some branches of the industry in these states there has been a decline during the past decade. Delaware has made considerable progress from 1880 to 1890 in the production of the more highly finished products of iron and steel, although producing neither the pig iron nor steel consumed by its rolling mills.

The comparative summary on the following page presents the leading statistics relating to the manufacture of iron and steel in the middle states as reported at the censuses of 1870, 1880, and 1890.

COMPARATIVE SUMMARY, IRON AND STEEL INDUSTRY IN THE MIDDLE STATES: 1870, 1880, AND 1890. (a)

ITEMS.	1870 (b)	1880 (b)	1890
Number of establishments	437	440	390
Capital	$77,696,741	$132,814,213	c$256,833,069
Miscellaneous expenses	(d)	(d)	$11,324,830
Average number of employés (aggregate)	46,000	75,055	108,592
Total wages	$24,436,722	$31,348,225	$59,914,027
Officers, firm members, and clerks:			
Average number	(e)	(e)	2,484
Total wages			$3,747,602
All other employés:			
Average number	(e)	(e)	106,108
Total wages			$56,166,425
Cost of materials used	$91,792,204	$113,432,592	$199,225,674
Value of products	f$134,720,519	$180,484,560	$294,048,406
Tons of products	2,408,634	4,492,746	10,613,053

a This statement includes only active establishments for the censuses of 1880 and 1890. Such establishments were not reported separately at the census of 1870.

b For explanation of the apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages, relating to mining and other operations in the figures for 1880.

c Includes hired property valued at $3,188,000. This item was not reported separately at previous censuses.

d Not reported. e Not reported separately. f Includes values for which tonnage was not reported.

The following comparative statement presents the leading statistics of the iron and steel industry of the middle states, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, IRON AND STEEL INDUSTRY IN THE MIDDLE STATES, BY STATES: 1880 AND 1890. (a)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Middle States	b1880	440	$132,814,213	75,055	$31,348,225	$113,432,592	$180,484,560
	1890	390	c256,833,069	d108,592	d59,914,027	199,225,674	294,048,406
Delaware	1880	8	1,341,469	867	344,476	1,214,050	2,347,177
	1890	7	2,558,865	1,690	843,219	1,549,539	2,608,670
New Jersey	1880	37	8,764,050	4,792	1,808,448	6,556,283	10,341,896
	1890	28	11,697,362	5 296	2,784,974	7,031,046	11,018,575
New York	1880	74	19,752,471	11,444	4,093,451	13,395,229	22,219,219
	1890	44	16,282,435	7,034	3,605,654	10,424,852	15,849,537
Pennsylvania	1880	321	102,956,223	57,952	25,095,850	92,267,030	145,576,268
	1890	311	226,294,407	94,572	52 680,180	180,220,237	264,571 624

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Includes hired property valued at $3,188,000. This item was not reported separately at the census of 1880.

d Includes 2,484 officers, firm members, and clerks and their wages, amounting to $3,747,602, distributed as follows: Delaware 53, $78,061; New Jersey 146, $228,183; New York 186, $301,843; and Pennsylvania 2,099, $3,129,515. These classes were not reported separately at the census of 1880.

CAPITAL.—The following statement shows the different items of capital in active and idle establishments and those in course of construction, reported for the iron and steel industry in the middle states at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, IRON AND STEEL INDUSTRY IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	504	a$139,378,522	$77,463,914	$61,914,608
	1890	445	b261,134,435	124,621,343	136,513,092
Establishments in operation	1880	440	132,814,213	73,611,414	59,202,799
	1890	390	256,833,069	121,401,973	135,431,096
Idle establishments	1880	60	5,823,750	3,852,500	1,971,250
	1890	52	3,733,587	2,750,272	983,315
Establishments in course of construction	1880	4	740,559	(c)	740,559
	1890	3	567,779	469,098	98,681

a See remarks in regard to the inclusion of capital relating to mining and other operations in the figures for 1880.

b Includes hired property valued at $3,188,000; also hired property valued at $18,000 invested in idle establishments. This item was not reported separately at the census of 1880.

c Not reported separately.

BLAST FURNACES.

Pennsylvania ranked first in the production of pig iron in 1880 and 1890. In 1880 New York and New Jersey ranked third and fourth, respectively, among the pig iron producing states in the quantity of pig iron made, but with the rapid development of the industry in other sections of the country during the past decade New York receded to fifth and New Jersey to tenth place.

The following comparative summary exhibits the growth of the blast furnace industry in the middle states since 1870:

COMPARATIVE SUMMARY, BLAST FURNACES IN THE MIDDLE STATES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880 (*b*)	1890
Number of establishments	181	179	140
Capital	$33,513,175	$53,969,265	*c*$68,896,144
Miscellaneous expenses	(*d*)	(*d*)	$3,163,843
Average number of employés (aggregate)	13,342	17,152	18,084
Total wages	$6,351,516	$6,021,406	$8,580,541
Officers, firm members, and clerks:			
Average number	(*e*)	(*e*)	422
Total wages			$674,974
All other employés:			
Average number	(*e*)	(*e*)	17,662
Total wages			$7,935,567
Cost of materials used	$29,312,678	$36,330,367	$63,115,306
Value of products	$42,105,838	*f*$55,818,738	*f*$82,650,533
Tons of products	1,311,649	2,401,093	5,356,883

a This statement includes only active establishments for the censuses of 1880 and 1890, such establishments were not reported separately at the census of 1870.

b For explanation of the apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.

c Includes hired property valued at $2,210,000. This item was not reported separately at previous censuses.

d Not reported.

e Not reported separately.

f Includes values for which tonnage was not reported.

The following comparative statement presents the leading statistics of the manufacture of pig iron in the middle states, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, BLAST FURNACES IN THE MIDDLE STATES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Middle States	*b*1880	179	$53,969,265	17,152	$6,021,406	$36,330,367	$55,818,738
	1890	140	*c*68,896,144	*d*18,084	*d*8,580,541	63,115,306	82,650,533
New Jersey	1880	12	3,644,500	1,174	365,639	2,488,670	3,428,747
	1890	8	3,131,366	655	262,538	1,679,937	2,228,724
New York	1880	30	8,836,471	2,518	902,929	4,166,622	6,816,241
	1890	16	6,443,208	1,462	672,288	4,212,888	5,182,606
Pennsylvania	1880	137	41,488,294	13,460	4,752,838	29,675,075	45,573,750
	1890	116	59,321,570	15,967	7,615,715	57,222,481	75,239,203

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés and wages relating to mining and other operations.

c Includes hired property valued at $2,210,000. This item was not reported separately at the census of 1880.

d Includes 422 officers, firm members, and clerks, and their wages amounting to $674,974 distributed as follows: New Jersey 15, $22,386; New York 52, $91,181, and Pennsylvania 355, $561,407. These classes were not reported separately at the census of 1880.

New Jersey shows a small decrease in output during the past decade, although there is an increase in the manufacture of spiegeleisen, all of which is made from zinc residuum. The quantity of spiegeleisen made in this state in 1890 was 11,555 net tons, against 3,392 tons in 1880. The total quantity of pig iron, including spiegeleisen, made in New Jersey in 1890 was 145,040 tons, valued at $2,228,724, against 157,414 tons in 1880, valued at $3,410,663, and other products valued at $18,084.

The total production of pig iron in New York in 1890 was 344,339 net tons, valued at $5,182,606, as compared with 313,368 tons in 1880, valued at $6,697,349, and other products valued at $118,892.

Notwithstanding a net decrease of 48 in the number of blast furnace stacks in Pennsylvania from 1880 to 1890, the production of pig iron has shown a phenomenal increase during this period. In 1880 the output of pig iron, including castings produced direct from the furnace was, 1,930,311 tons, as compared with a production of

4,867,504 tons in 1890. The most notable increase has been in the production of coke and bituminous coal pig iron, which amounted to 674,668 tons in 1880 and 2,982,800 tons in 1890.

In the above figures castings made direct from the furnaces are counted as pig iron.

CAPITAL.—The following statement shows the different items of capital in active and idle establishments and those in course of construction, reported for blast furnaces in the middle states at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, BLAST FURNACES IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products, on hand, cash and bills receivable.
Total	1880	219	a$58,419,574	$30,895,173	$27,524,401
	1890	172	b71,802,943	38,429,719	33,373,224
Establishments in operation	1880	179	53,969,265	28,281,173	25,688,092
	1890	140	68,896,144	36,311,656	32,584,488
Idle establishments	1880	38	4,059,750	2,614,000	1,445,750
	1890	31	2,434,880	1,730,965	703,915
Establishments in course of construction	1880	2	390,559	(c)	390,559
	1890	1	471,919	387,098	84,821

a See remarks in regard to the inclusion of capital relating to mining and other operations in the figures for 1880.
b Includes hired property valued at $2,210,000. This item was not reported separately at the census of 1880.
c Not reported separately.

EMPLOYÉS AND WAGES.—The following statement presents the average number and total wages of officers or firm members and clerks, and the average number and total wages of skilled and unskilled employés in the blast furnace industry of the middle states, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, BLAST FURNACES IN THE MIDDLE STATES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
Total	18,084	$8,580,541	18,049	$8,571,721	2	$1,090	33	$7,730
Officers or firm members	181	482,670	181	482,670	.....	.....	.....	.....
Clerks	241	192,304	239	191,214	2	1,090	.....	.....
Skilled	5,540	3,106,454	5,540	3,106,454	.....	.....	.....	.....
Unskilled	12,122	4,799,113	12,089	4,791,383	.....	.....	33	7,730

The following statement presents the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, BLAST FURNACES IN THE MIDDLE STATES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.	
	Males above 16 years.	Children.
Total	17,629	33
Under $5	115	17
$5 and over but under $6	72	16
$6 and over but under $7	1,396	.....
$7 and over but under $8	2,138	.....
$8 and over but under $9	2,511	.....
$9 and over but under $10	4,173	.....
$10 and over but under $12	3,617	.....
$12 and over but under $15	2,414	.....
$15 and over but under $20	853	.....
$20 and over but under $25	234	.....
$25 and over	106	.....

MATERIALS USED.—The extent to which coke has superseded anthracite coal as blast furnace fuel is well shown by the statistics of the consumption of this fuel for the 2 census years in New Jersey and New York. The furnaces of New Jersey consumed 225,713 tons of anthracite coal and 17,000 tons of coke in 1880, and 173,067 tons of anthracite coal and 37,856 tons of coke in 1890. In 1880 the furnaces in New York used 396,864 tons of anthracite coal and 34,237 tons of coke, as compared with the consumption by the furnaces of this state in 1890 of 185,348 tons of anthracite coal and 241,824 tons of coke. In 1880 a large number of the blast furnaces in New York and New Jersey employed anthracite coal exclusively.

Of the northern states Pennsylvania contains the richest coal suitable for the manufacture of pig iron, whether used in the raw state or in the form of coke, but the advantages which the state enjoys in the vast fields of anthracite coal and the superior character of the coke made from the coal found in the Connellsville region are partially neutralized by an insufficient supply of iron ores of the requisite purity and richness. With the exception of the Cornwall and a few other deposits, the general character of the iron ores of Pennsylvania is unsuitable for steel making, and the blast furnaces are compelled to look to other states or to foreign sources for a large part of the iron ore required. Notwithstanding this dependence on other sections for much of the iron ore consumed by her blast furnaces, the excellent fuel and a large demand from the diversified manufacturing industries within her own borders has placed Pennsylvania in the foremost rank of pig iron producing states.

The following comparative statement presents the quantity and cost of materials used by blast furnaces in the middle states, as reported at the censuses of 1880 and 1890. With the exception of charcoal, which is given in bushels, the quantities are reported in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, BLAST FURNACES IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Value.	Quantity.	Value.
Total	.....	$36,330,367	.....	$63,115,206
Domestic iron ore	4,762,296	21,547,883	7,697,520	33,658,807
Foreign iron ore	(a)	(a)	942,435	5,171,011
Fluxing material	2,272,473	1,706,794	3,410,243	2,560,456
Anthracite coal	2,514,165	7,663,607	2,012,432	5,165,620
Bituminous coal	215,849	529,488	50,985	79,405
Coke	1,105,689	3,854,538	4,588,974	13,268,527
Charcoal	7,696,586	581,224	4,729,729	317,294
Mill cinder and scrap	156,417	417,158	866,853	1,979,393
All other materials	.....	58,675	.....	974,193

a Domestic and foreign iron ore were not reported separately at the census of 1880.

PRODUCTS.—In the following statement is shown the total production of pig iron in the middle states in 1880 and 1890, classified according to fuel used. The figures include quantity of spiegeleisen and castings made direct from the furnace:

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF PRODUCTS CLASSIFIED ACCORDING TO KIND OF FUEL USED, BLAST FURNACES IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Tons.	Value.	Tons.	Value.
Total	.....	$55,818,738	.....	$82,650,553
Mixed anthracite and coke pig iron	564,102	12,922,436	1,893,241	28,195,996
Coke and bituminous pig iron	674,668	16,764,521	3,099,429	48,922,560
Charcoal pig iron	55,686	1,983,901	33,327	733,511
Anthracite coal pig iron	1,106,637	23,377,182	330,886	4,772,021
Total tonnage and value	a2,401,093	55,048,040	b5,356,883	82,624,088
All other products	.....	770,698	.....	26,445

a Two thousand three hundred and fifty-nine tons of direct castings, shown in the report for blast furnaces, 1880, have been distributed in this statement among the several kinds of pig iron. Of this amount New York contributed 62 tons, New Jersey 80 tons, and Pennsylvania 2,217 tons. There is also included 12,875 tons of spiegleisen, of which amount New Jersey produced 3,392 tons and Pennsylvania 9,483 tons.

b Includes 111,317 tons of spiegeleisen and ferro-manganese, New Jersey producing 11,555 tons and Pennsylvania 99,762 tons; also 5,318 tons castings direct from the furnace, New Jersey producing 130 tons, New York 10 tons, and Pennsylvania 5,178 tons.

MACHINERY.—While the number of active and idle blast furnace establishments in the middle states has declined from 217 in 1880 to 171 in 1890, and the number of furnace stacks from 346 to 276, the daily capacity has increased from 10,835 tons in 1880 to 22,128 tons in 1890. Larger stacks, improved machinery, with better furnace practice, and the use of more carefully selected ores constitute the chief causes of this great increase in daily capacity, notwithstanding that the decrease in the number of furnaces has been so marked.

In the following table is presented a comparison of the number and daily capacity of the furnaces in the middle states in 1880 and 1890, classified according to the character of fuel used:

COMPARATIVE STATEMENT, NUMBER AND DAILY CAPACITY OF BLAST FURNACES IN THE MIDDLE STATES, BY STATES: 1880 AND 1890.

STATES.	Year.	AGGREGATES.		CHARCOAL.		ANTHRACITE COAL.		MIXED ANTHRACITE COAL AND COKE.		COKE AND BITUMINOUS COAL.	
		Number of stacks.	Daily capacity in tons.	Number of stacks.	Daily capacity in tons.	Number of stacks.	Daily capacity in tons.	Number of stacks.	Daily capacity in tons.	Number of stacks.	Daily capacity in tons.
Total	1880	346	10,835	51	414	143	4,187	77	2,926	75	3,308
	1890	276	22,128	24	345	35	1,591	132	8,805	85	11,387
New Jersey	1880	20	691	.....	.....	11	251	9	440	.....	.....
	1890	18	926	.....	.....	4	86	14	840	.....	.....
New York	1880	57	1,654	15	172	15	450	27	1,032	.....	.....
	1890	37	2,109	9	166	4	122	20	1,131	4	690
Pennsylvania	1880	269	8,490	36	242	117	3,486	41	1,454	75	3,308
	1890	221	19,093	15	179	27	1,383	98	6,834	81	10,697

ROLLING MILLS AND STEEL WORKS.

The census of 1880 credited New Jersey with 14 iron rolling mills, 1 open-hearth steel works, and 5 crucible steel works. In 1890 the state contained 12 iron and steel rolling mills not connected with steel producing works, 2 establishments containing open-hearth steel plants, and 7 crucible steel works.

Including active and idle establishments, New York, at the census of 1880, was credited with 28 establishments, 23 being iron rolling mills, 2 bessemer steel works (one producing the crude steel as well as rolling it, the other only rolling bessemer steel from purchased material), and 3 crucible steel producing works. The 20 establishments in this state in 1890 consisted of 12 iron and steel rolling mills not connected with steel producing works, and 8 establishments which were equipped for the manufacture of crude steel. These 8 establishments comprised 1 bessemer steel plant, 2 open-hearth steel plants, 5 crucible steel plants, and 2 plants equipped for the production of blister steel.

In 1880 Pennsylvania contained 131 iron rolling mills, 15 bessemer and open-hearth steel works, and 20 crucible steel works. The bessemer and open-hearth steel works contained 12 bessemer converters and 14 open-hearth steel melting furnaces. In 1890 there were 133 iron and steel rolling mills not connected with steel producing works, and 60 establishments equipped for the manufacture of crude steel. The steel works comprised 22 bessemer steel plants with 46 converters (including 4 Clapp-Griffiths and 2 Robert-Bessemer plants), 32 open-hearth steel plants with 78 steel melting furnaces, 20 crucible steel plants, and 4 works which produced steel by special processes. Of the 60 steel producing works 10 operated both bessemer and open-hearth steel plants, 6 both open hearth and crucible plants, 1 both bessemer and special steel plants, and 1 both crucible and special steel plants. All the establishments engaged in steel production with the exception of 1 bessemer, 2 open-hearth, 7 crucible, and 1 special contained trains of rolls.

The prominence of Delaware in the manufacture of iron and steel is due entirely to its rolling mill industry. The state contains neither blast furnaces nor steel works, and all the pig iron and steel consumed is obtained from other sections.

The following statement shows the leading statistics relating to the rolling mills and steel works in the middle states, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1870, 1880, AND 1890. (a)

ITEMS.	1870 (b)	1880	1890
Number of establishments	190	208	231
Capital	$40,107,083	$75,538,948	c$187,098,455
Miscellaneous expenses	(d)	(d)	$8,107,807
Average number of employés (aggregate)	30,159	55,631	90,082
Total wages	$17,016,982	$24,581,865	$51,151,112
Officers, firm members, and clerks:			
Average number	(e)	(e)	2,047
Total wages			$3,055,319
All other employés:			
Average number	(e)	(e)	88,035
Total wages			$48,095,793
Cost of materials used	$57,147,662	$74,957,356	$135,338,945
Value of products (f)	$85,537,084	$121,421,562	$210,389,379
Tons of products	992,431	2,031,533	5,226,715

a This statement includes only active establishments for 1880 and 1890; such establishments were not reported separately at the census of 1870.
b See remarks in regard to the depreciated currency of 1870.
c Includes hired property valued at $978,000. This item was not reported separately at previous censuses.
d Not reported.
e Not reported separately.
f Includes values for which tonnage was not reported.

The following comparative statement presents the leading statistics of rolling mills and steel works in the middle states, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES, BY STATES: 1880 AND 1890. (a)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Middle States	1880	208	$75,538,948	55,631	$24,581,865	$74,957,356	$121,421,562
	1890	231	b187,098,455	c90,082	c51,151,112	135,338,945	210,389,379
Delaware	1880	8	1,341,469	867	344,476	1,214,050	2,347,177
	1890	7	2,538,865	1,690	843,219	1,549,539	2,608,670
New Jersey	1880	18	5,005,550	3,495	1,412,622	3,914,970	6,704,054
	1890	19	8,525,996	4,627	2,514,404	5,326,401	8,756,431
New York	1880	24	8,702,000	7,437	2,725,191	8,264,186	13,924,622
	1890	19	9,321,793	5,418	2,872,316	5,932,461	10,310,088
Pennsylvania	1880	158	60,489,929	43,872	20,099,576	61,564,150	98,445,709
	1890	186	166,691,801	78,347	44,921,173	122,530,544	188,714,190

a This statement includes only active establishments.
b Includes hired property valued at $978,000. This item was not reported separately at previous censuses.
c Includes 2,047 officers, firm members, and clerks and their wages, amounting to $3,055,319, distributed as follows: Delaware 53, $78,061; New Jersey 129, $212,812; New York 127, $199,862, and Pennsylvania 1,738, $2,564,584. These classes were not reported separately at the census of 1880.

During the decade from 1880 to 1890, a great increase is shown in the products of the rolling mills and steel works of the middle states. The tonnage of iron products increased 47.04 per cent, and the steel tonnage increased 368.37 per cent. Of the total tonnage of iron and steel, iron formed 65.69 per cent in 1880 and 37.55 per cent in 1890, while the tonnage of steel which constituted but 34.31 per cent of the total product in 1880 constitutes 62.45 per cent in 1890.

The establishments in Delaware in 1890 were all located in Newcastle county, at Wilmington, and in its vicinity, many of the plants making a specialty of the manufacture of plate and sheet iron. The increase in the tonnage of products from 1880 to 1890 has been almost entirely in iron, the state producing no steel products in 1880, and only a small quantity in 1890. The aggregate production of iron products has increased from 33,918 tons in 1880 to 57,913 tons in 1890, or 70.74 per cent. The steel products in 1890 consisted of 380 tons of bessemer steel and 144 tons of open-hearth steel.

There has been a slight decrease since 1880 in the aggregate tonnage of the products of rolling mills and steel works in the state of New York. The iron products, which in 1880 amounted to 64.58 per cent of the total tonnage, contributed only 45.61 per cent of the total in 1890. On the other hand, the steel products in 1880 amounted to only 35.42 per cent of the aggregate tonnage of that year, but in 1890 the proportion of steel products of all kinds was 54.39 per cent of the total tonnage.

In New Jersey a notable increase has occurred during the past 10 years in the tonnage of both iron and steel products. In 1880 the percentage of the total represented by iron products was 79.92 per cent and by steel 20.08 per cent. In 1890 the proportion of iron was reduced to 57.11 per cent, that of steel increasing to 42.89 per cent.

The substitution of steel for iron in the manufacture of rails, nails, plates, and other forms of finished products has been especially marked in Pennsylvania. The capacity of the state for the production of steel rails has shown a notable increase from 1880 to 1890, besides which there have been erected during this period a large number of bessemer converters and open-hearth steel melting furnaces, many of which have been added to existing iron rolling mill establishments for the production of steel for nail plate, structural material, wire, and many miscellaneous purposes. While the tonnage of iron products has increased 59.20 per cent from 1880 to 1890, the above figures show that they contributed only 35.74 per cent of the aggregate of all products in 1890, although the proportion in 1880 was 64.45 per cent, the quantity of steel products amounted to 35.55 per cent of the total output of iron and steel in 1880 and 64.26 per cent in 1890.

CAPITAL.—The following statement shows the different items of capital in active and idle establishments and those in course of construction, rolling mills and steel works in the middle states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	223	$77,432,948	$44,784,241	$32,648,707
	1890	245	a188,366,722	85,818,824	102,547,898
Establishments in operation	1880	208	75,538,948	43,676,241	31,862,707
	1890	231	187,098,455	84,782,317	102,316,138
Idle establishments	1880	13	1,544,000	1,108,000	436,000
	1890	12	1,172,407	954,507	217,900
Establishments in course of construction	1880	2	350,000	(b)	350,000
	1890	2	95,860	82,000	13,860

a Includes hired property valued at $978,000, also hired property valued at $18,000 invested in idle establishments. This item was not reported separately at the census of 1880.

b Not reported separately.

EMPLOYÉS AND WAGES.—The following statement presents the average number and total wages of officers or firm-members and clerks and the average number and total wages of skilled and unskilled employés in rolling mills and steel works in the middle states, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1890.

CLASSES.	AGGREGATES.		MALES ABOVE 16 YEARS.		FEMALES ABOVE 15 YEARS.		CHILDREN.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
Total	90,082	$51,151,112	88,868	$50,910,329	37	$19,278	1,177	$221,505
Officers or firm members	505	1,631,956	505	1,631,956				
Clerks	1,542	1,423,363	1,507	1,404,651	35	18,712		
Skilled	49,669	33,909,589	49,669	33,909,589				
Unskilled	38,366	14,186,204	37,187	13,964,133	2	566	1,177	221,505

The following statement presents the average number of employes at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS		
	Males above 16 years.	Females above 15 years.	Children.
Total	86,856	2	1,177
Under $5	850	1	1,013
$5 and over but under $6	2,005	.....	123
$6 and over but under $7	5,964	.....	33
$7 and over but under $8	10,047	.....	6
$8 and over but under $9	12,945	.....	2
$9 and over but under $10	11,012	1	.....
$10 and over but under $12	11,288	.....	.....
$12 and over but under $15	12,575	.....	.....
$15 and over but under $20	10,542	.....	.....
$20 and over but under $25	5,617	.....	.....
$25 and over	4,011	.....	.....

MATERIALS USED.—The total cost of all the materials consumed by the rolling mills and steel works in Delaware was $1,214,050 in 1880 and $1,549,539 in 1890; by the works in New Jersey, $3,914,970 in 1880 and $5,326,401 in 1890; by the works in New York, $8,264,186 in 1880 and $5,932,461 in 1890, and by the works in Pennsylvania, $61,564,150 in 1880, as compared with a total of $122,530,544 in 1890.

The following comparative statement presents the quantities and cost of materials consumed by the rolling mills and steel works in the middle states, for the census years 1880 and 1890. With the exception of charcoal, which is stated in bushels, and oil used for fuel, which is stated by barrels, the quantities are reported in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Cost.	Quantity.	Cost.
Total	.....	$74,957,356	.....	$135,338,945
Iron ore	246,980	1,795,093	429,903	2,413,590
Spiegeleisen and ferro-manganese	55,194	1,723,890	181,903	5,366,006
Pig iron	1,672,813	37,718,153	4,146,205	64,895,917
Old iron rails	259,017	7,353,501	79,320	1,890,136
Other old or scrap iron	193,056	5,116,841	462,841	8,193,313
Old steel rails	42,977	1,137,290	114,400	1,966,315
Other old or scrap steel	80,639	2,131,335	265,523	4,957,421
Hammered iron ore blooms	27,541	1,719,355	15,615	555,293
Hammered pig or scrap blooms	37,103	2,012,682	21,410	663,419
Purchased muck bar	44,117	1,867,540	217,353	5,793,198
Purchased bessemer steel	a34,855	a1,788,497	430,658	12,535,669
Purchased open hearth steel	b21,303	b1,251,860	119,419	3,909,969
Swedish billets and bars	9,765	809,496	13,553	874,198
Anthracite coal	658,304	1,649,002	942,491	1,398,354
Bituminous coal	2,571,081	5,555,337	2,203,691	4,854,856
Coke	90,483	297,572	216,327	636,443
Charcoal	1,476,716	137,328	1,612,695	146,862
Oil used for fuel	.....	.....	190,813	177,807
Natural gas	.....	.....	.....	3,391,468
All other materials	.....	832,584	.....	10,699,311

a Includes 9,216 tons "Other billets and bars" costing $507,509.
b Includes 7,030 tons "Other billets and bars" costing $388,398.

PRODUCTS.—The following comparative statement shows the tonnage of iron and steel products for rolling mills and steel works in the middle states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, QUANTITY OF PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880	1890
Total	2,031,533	5,226,715
Iron	1,334,584	1,962,405
Bessemer steel	570,885	2,705,743
Open-hearth steel	53,559	491,475
Crucible and miscellaneous steel	72,505	67,092

The following comparative statement presents the values of the different iron and steel products and the percentage that each class bears of the total, for the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, VALUE OF PRODUCTS WITH PERCENTAGE EACH CLASS IS OF TOTAL, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	VALUE.		PERCENTAGE.	
	1880	1890	1880	1890
Total	$121,421,562	$210,389,379	100.00	100.00
Manufactures of iron	77,526,376	81,203,706	63.85	38.62
Manufactures of steel	43,013,822	125,933,307	35.42	59.86
Miscellaneous products	881,364	3,192,366	0.73	1.52

The total value of all iron and steel products of rolling mills and steel works in the middle states was $121,421,562 in 1880 and $210,389,379 in 1890. The value of the manufactures of iron in 1880 was $77,526,376 and constituted 63.85 per cent of the total value of all products, while in 1890 the value of iron manufactures was $81,263,706 and formed but 38.62 per cent of the total value of all products. The value of the manufactures of steel increased from $43,013,822 in 1880 to $125,933,307 in 1890, constituting 35.42 per cent of the total value of all products in 1880 and 59.86 per cent in 1890. The value of all other products was $881,364 and $3,192,366 for 1880 and 1890, respectively, and the percentage of the total value of all products was 0.73 per cent in 1880 and 1.52 per cent in 1890.

The following comparative statement presents the quantity and value of classified iron and steel products, as reported at the censuses of 1880 and 1890. With the exception of nails, which are stated in kegs of 100 pounds, the quantities are shown in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF CLASSIFIED PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Quantity.	Value.	Quantity.	Value.
Total		$121,421,562		$210,389,379
Iron:				
Bar and rod	441,929	24,275,523	556,207	22,501,250
Rails	191,518	8,068,759	2,571	95,590
Plates, except nail plates	119,154	7,885,733	170,036	7,509,238
Sheets	60,567	5,833,074	87,188	5,624,872
Muck bar produced for sale	56,524	2,100,255	201,846	5,306,421
Hammered and rolled car axles	9,766	731,331	10,059	450,218
Hoop	67,799	4,317,192	95,248	3,929,037
Skelp	116,248	7,106,738	437,173	16,532,538
Structural shapes	94,025	5,340,619	130,957	6,639,974
Cut nails	1,812,280	5,837,433	1,519,545	3,041,429
All other finished products	86,440	5,969,719	194,243	9,633,139
Steel, bessemer:				
Bar and rod	87,529	5,443,959	281,814	10,963,256
Rails	467,209	21,053,995	1,436,265	42,321,749
Plates, except nail plates	1,475	148,144	57,526	2,550,248
Sheets			34,004	2,412,122

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF CLASSIFIED PRODUCTS, ETC.—Continued.

CLASS OF PRODUCTS.	1880		1890	
	Quantity.	Value.	Quantity.	Value.
Steel, bessemer—Continued.				
Hammered car axles			2,620	$116,395
Hoop			2,640	111,803
Skelp			9,630	390,183
Structural shapes	557	$63,060	90,756	4,312,183
Cut nails			641,139	1,269,626
All other finished products	14,115	712,162	757,531	26,310,642
Steel, open-hearth:				
Bar and rod	28,845	2,411,319	86,269	4,197,871
Rails	3,360	151,200		
Plates, except nail plates	2,280	293,200	152,042	7,930,850
Sheets	1,050	127,000	29,098	2,233,735
Hammered and rolled car axles			9,559	521,895
Hoop			3,532	160,000
Structural shapes			74,012	3,855,414
Cut nails			4,000	37,110
All other finished products	18,024	1,740,841	136,763	7,721,978
Steel (crucible and miscellaneous):				
Finished products	72,505	10,268,942	67,092	8,507,247
All other products		881,364		3,192,366

MACHINERY.—The following comparative statement presents the equipment and capacity of the rolling mills and steel works of the middle states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, EQUIPMENT AND CAPACITY, ROLLING MILLS AND STEEL WORKS IN THE MIDDLE STATES: 1880 AND 1890. (*a*)

MACHINERY.	1880	1890	Increase.
Single puddling furnaces	2,682	3,160	478
Heating furnaces	1,538	1,877	339
Bessemer converters	14	48	34
Open-hearth furnaces	15	84	69
Crucible pots which can be used at each heat	2,384	2,258	c126
Hammers	299	413	114
Cut nail machines	1,641	1,953	312
Trains of rolls	776	923	147
Aggregate daily capacity in tons of finished products	12,686	27,861	15,175

a Includes machinery in both active and idle establishments.
b Includes 6 Clapp-Griffiths and 4 Robert-Bessemer converters.
c Decrease.

FORGES AND BLOOMERIES.

Pennsylvania has always ranked first in the production of charcoal blooms from pig and scrap iron, while New York has occupied a similar position in the production of charcoal blooms direct from iron ore. In 1880 the total production of charcoal blooms and hammered bar iron direct from iron ore and blooms from pig iron and scrap iron was 72,557 tons, of which quantity the middle states produced 60,120 tons, or 82.86 per cent. Since 1880 this industry has seriously felt the competition of modern processes of iron and steel manufacture, and while the number of active and idle establishments in the United States has decreased from 118 in 1880 to 32 in 1890, the output has declined in 1890 to 34,775 tons, of which works located in the middle states produced 29,455 tons. Of the 20 active establishments in the United States in 1890, 19 were located in the middle states, as follows: New York 9, New Jersey 1, and Pennsylvania 9. The details of the industry will be found in the report on forges and bloomeries.

SOUTHERN STATES.

One of the most notable features of the growth of the iron and steel industry during the past decade is the activity displayed in southern states in the erection of iron making plants, particularly large coke blast furnaces. In direct connection with this work there has been an advance almost equally great in the development of the extensive mineral resources necessary to the operation of these iron making establishments. Steel making, although not wholly neglected, has not formed a prominent feature of this metallurgical development.

The progress made by the southern states in the manufacture of iron and steel during the past 20 years is shown in the summary on the following page, the statistics being for the census years 1870, 1880, and 1890.

In compiling the figures of this summary the geographical division of the southern states is considered as comprising the iron making states of Alabama, Georgia, Kentucky, Maryland, North Carolina, Tennessee, Texas, Virginia, and West Virginia; also the District of Columbia, South Carolina, and Mississippi.

COMPARATIVE SUMMARY, IRON AND STEEL INDUSTRY IN THE SOUTHERN STATES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880 (*b*)	1890
Number of establishments	171	130	109
Capital	$12,859,885	$21,942,211	*c*$43,051,652
Miscellaneous expenses	(*d*)	(*d*)	$2,110,129
Average number of employés (aggregate)	10,884	19,728	17,601
Total wages	$4,699,150	$5,916,868	$7,669,600
Officers, firm members and clerks:			
Average number	(*e*)	(*e*)	550
Total wages			$806,415
All other employés:			
Average number	(*e*)	(*e*)	17,051
Total wages			$6,863,185
Cost of materials used	$10,876,239	$13,739,624	$27,047,767
Value of products	*f*$20,696,605	$23,006,074	$39,982,152
Tonnage of products	345,572	615,235	2,207,184

a This statement includes only active establishments for the censuses of 1880 and 1890; such establishments were not reported separately at the census of 1870.

b For explanation of the apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.

c Includes hired property valued at $1,283,000. This item was not reported separately at previous censuses.

d Not reported.

e Not reported separately.

f Includes values for which no tonnage was reported.

The following comparative statement presents the leading statistics of the iron and steel industry of the southern states, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, IRON AND STEEL INDUSTRY IN THE SOUTHERN STATES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Southern States	*b*1880	130	$21,942,311	19,728	$5,916,868	$13,739,624	$23,006,074
	1890	109	*c*43,051,652	*d*17,601	*d*7,669,600	27,047,767	39,982,152
Alabama	1880	8	2,757,196	1,626	571,713	601,073	1,452,856
	1890	35	17,987,583	5,678	2,522,008	7,425,344	12,544,227
District of Columbia	1880	1	89,600	18	7,528	2,264	10,970
	1890						
Georgia	1880	9	973,800	1,303	185,489	631,707	990,850
	1890	5	908,243	357	112,170	321,728	471,757
Kentucky	1880	18	4,610,035	4,095	1,344,400	3,223,799	5,090,029
	*e*1890						
Maryland	1880	18	4,402,125	2,763	905,000	2,888,574	4,470,050
	1890	10	4,217,574	1,272	396,351	2,217,173	2,869,208
North Carolina	1880	9	199,400	63	7,907	11,792	41,085
	*e*1890						
Tennessee	1880	29	2,862,826	3,077	659,773	1,376,059	2,274,203
	1890	15	4,613,355	1,557	775,521	2,943,671	4,247,868
Texas	1880	1	40,000	140	27,720	23,580	36,000
	*e*1890						
Virginia	1880	21	2,294,713	2,522	665,432	1,496,151	2,585,909
	1890	21	6,330,903	3,110	1,263,360	4,404,452	6,326,084
West Virginia	1880	16	3,712,616	4,121	1,541,816	3,484,625	6,054,032
	1890	12	6,458,924	3,833	1,838,209	7,906,036	10,556,865
All other states	*e*1890	11	2,534,980	1,594	761,981	1,829,363	2,966,143

a This statement includes only active establishments.

b For explanation of apparent discrepancies in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Includes hired property valued at $1,283,000. This item was not reported separately at the census of 1880.

d Includes 550 officers, firm members, and clerks and their wages amounting to $806,415, distributed as follows: Alabama 193, $319,044; Georgia 18, $23,125; Kentucky, including 1 establishment in North Carolina and 1 in Texas 53, $72,089; Maryland 25, $24,358; Tennessee 85, $118,446; Virginia 100, $145,908; West Virginia 76, $103,445. These classes were not reported separately at the census of 1880.

e Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: North Carolina 1, Texas 1, Kentucky 9.

The decrease in the number of establishments in 1890 as compared with 1880 is due to the fact that a large number of charcoal furnaces of small size and unfavorably situated for securing cheap materials and distribution of their product have been abandoned during the past decade, while many of the furnaces operated in 1880 by separate firms or companies or built in succeeding years by distinct organizations have since been consolidated under one management and appear in the tabulations for 1890 as single establishments.

CAPITAL.—The following comparative statement shows the different items of capital in active and idle establishments and those in course of construction in the iron and steel industry in the southern states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, IRON AND STEEL INDUSTRY IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL. Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	209	a$27,714,361	$12,393,191	$15,321,170
	1890	159	b47,884,944	30,756,795	17,128,149
Establishments in operation	1880	130	21,942,311	9,843,441	12,098,870
	1890	109	43,051,652	26,950,403	16,101,249
Idle establishments	1880	76	5,079,050	1,960,300	3,118,750
	1890	27	1,935,693	1,502,193	433,500
Establishments in course of construction	1880	3	693,000	589,450	103,550
	1890	23	2,897,599	2,304,199	593,400

a See remarks in regard to inclusion of capital relating to mining and other operations in the figures for 1880.
b Includes hired property valued at $1,283,000. This item was not reported separately at the census of 1880.

BLAST FURNACES.

It is in the manufacture of pig iron that the progress and activity of the iron industry of the southern states has been particularly marked during the decade from 1880 to 1890. This section has been long noted for the excellent character of the charcoal pig iron produced within its borders; but prior to 1880 attention was not especially directed to its extensive and easily worked deposits of iron ore, nor to the advantages which the close proximity of coking coal and limestone to these deposits afforded for the production of coke pig iron at low cost. During 1880 the southern states produced 9.27 per cent of the aggregate pig iron yield of the United States, but in 1890 the furnaces in this section contributed 18.52 per cent of the total output, the increase in tonnage over 1880 being 423.52 per cent.

The growth of the blast furnace industry in the southern states is indicated by the following summary, which presents the leading statistics of this branch of the industry, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, BLAST FURNACES IN THE SOUTHERN STATES: 1870, 1880, AND 1890. (a)

ITEMS.	1870 (b)	1880 (b)	1890
Number of establishments	91	59	73
Capital	$7,897,325	$11,890,907	c$29,974,471
Miscellaneous expenses	(d)	(d)	$1,578,512
Average number of employés (aggregate)	5,488	9,486	8,264
Total wages	$1,668,160	$2,186,855	$3,416,278
Officers, firm members, and clerks:			
Average number	(e)	(e)	332
Total wages			$499,120
All other employés:			
Average number	(e)	(e)	7,932
Total wages			$2,917,158
Cost of materials used	$3,562,955	$4,452,864	$15,410,982
Value of products	$7,008,137	f$7,769,050	$22,494,870
Tonnage of products	184,540	350,436	1,834,586

a This statement includes only active establishments for 1880 and 1890; such establishments were not reported separately at the census of 1870.
b For explanation of apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.
c Includes hired property valued at $783,000. This item was not reported separately at previous censuses.
d Not reported.
e Not reported separately.
f Includes values for which tonnage was not reported.

The following comparative statement presents the leading statistics of the blast furnace industry in the southern states, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, BLAST FURNACES IN THE SOUTHERN STATES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Southern States	*b*1880	59	$11,890,907	9,486	$2,186,855	$4,452,864	$7,769,050
	1890	73	*c*29,974,471	*d*8,264	*d*3,416,278	15,410,982	22,494,870
Alabama	1880	7	2,707,196	1,566	553,713	575,673	1,405,356
	1890	28	15,778,786	4,139	1,783,700	6,493,884	10,315,691
Georgia	1880	5	712,000	754	77,415	241,796	466,890
	1890	4	748,845	269	64,676	237,836	339,422
Kentucky	1880	9	2,098,035	1,890	429,988	801,410	1,248,652
	1890						
Maryland	1880	12	2,197,125	1,443	339,978	956,806	1,700,339
	1890	5	3,108,222	639	151,342	1,316,539	1,632,004
Tennessee	1880	9	1,422,626	1,579	261,897	489,440	840,022
	1890	11	3,685,806	1,076	525,992	2,450,882	3,366,464
Texas	1880	1	40,000	140	27,720	23,580	36,000
	*e*1890						
Virginia	1880	8	1,391,500	1,221	255,986	205,548	440,695
	1890	15	4,156,206	1,328	558,312	2,820,167	3,925,481
West Virginia	1880	8	1,322,425	893	240,158	1,158,611	1,631,096
	1890	4	1,446,082	424	198,933	1,503,847	2,009,505
All other states	*e*1890	6	1,050,524	389	133,323	587,827	906,303

a This statement includes only active establishments.

b For explanation of apparent discrepancies in the data for 1880 see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Includes hired property valued at $783,000. This item was not reported separately at the census of 1880.

d Includes 332 officers, firm members, and clerks and their wages amounting to $499,120, distributed as follows: Alabama 150, $262,396; Georgia 15, $19,175; Kentucky (including North Carolina and Texas) 21, $25,488; Maryland 9, $7,530; Tennessee 64, $87,616; Virginia 60, $80,207; West Virginia 13, $16,758. These classes were not reported separately at the census of 1880.

e Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: North Carolina 1, Texas 1, Kentucky 4.

Alabama shows the greatest increase in the blast furnace industry during the past decade. Jefferson county in that state, in which the city of Birmingham is located, is now the most important iron making center in the south. In 1880 there were but 2 establishments in the county, operating 3 blast furnaces, with an invested capital of $1,080,800, but in 1890 this district contained 10 blast furnace establishments with 24 furnaces, the total capital directly invested in the manufacture of pig iron being $8,938,110. Virginia has long occupied an important position among the iron producing states of the country. In 1880 more than one-half of the pig iron made in that state was produced with charcoal as fuel, but with the development of the Flat Top coke fields an important advance has taken place in the erection of coke furnaces, and Virginia is now second in rank among the southern pig iron producing states. Tennessee has shown considerable progress in the erection of both coke and charcoal furnaces, and is now the third producer of pig iron in the southern section. While West Virginia is classed among the southern states, its pig iron industry at the present time partakes largely of the characteristics of the establishments located in the northern and western sections of the country. During the past decade the manufacture of charcoal pig iron in West Virginia has been abandoned, and by far the larger part of the coke pig iron is produced from Lake Superior ores, the furnaces being located in Ohio and Marshall counties, at Wheeling and in its vicinity. The only furnace in the state using local ores exclusively is situated in Preston county.

While Maryland shows an increase in capital during the past 10 years a slight decrease is shown in the value of products, owing to the decline in the manufacture of charcoal pig iron, and also to the reduction in the prices of all kinds of pig iron. Four large coke furnaces were built at Sparrow Point, Baltimore, in 1890. Two of these stacks were put in operation toward the close of the census year.

The pig iron industry of Kentucky has shown a marked decline during the past decade. In 1880 the state contained 22 blast furnaces, of which number 18 were small charcoal stacks, located principally in Greenup, Boyd, Carter, Estill, and Trigg counties. With the exception of 1 furnace in Greenup county, all these charcoal stacks have been abandoned. During 1890 a number of coke furnaces were under construction, only one of which, however, was completed, but not blown in at the close of the year.

The pig iron industry of Georgia remained practically stationary during the decade from 1880 to 1890. Little progress was made in Texas prior to 1890. In that year, however, 2 charcoal furnaces were completed, but not blown in.

The 7 charcoal furnaces in North Carolina in 1880 were idle in that year, and all have since been considered by their owners as abandoned or classed as long inactive furnaces. The only active furnace in the state was built in 1884 to smelt Cranberry ores, using charcoal as fuel, but during the latter part of the census year 1890 it was run on coke.

CAPITAL.—The following statement shows the different items of capital in active and idle establishments and those in course of construction in the blast furnace industry in the southern states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, BLAST FURNACES IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	121	a$16,964,207	$6,016,941	$10,947,266
	1890	110	b33,207,370	22,592,812	10,614,558
Establishments in operation	1880	59	11,890,907	3,954,841	7,936,066
	1890	73	29,974,471	20,026,113	9,948,358
Idle establishments	1880	60	4,533,300	1,607,650	2,925,650
	1890	19	1,309,300	945,800	363,500
Establishments in course of construction	1880	2	540,000	454,450	85,550
	1890	18	1,923,599	1,620,899	302,700

a See remarks in regard to the inclusion of capital relating to mining and other operations in the figures for 1880.
b Includes hired property valued at $783,000. This item was not reported separately at the census of 1880.

During the decade from 1880 to 1890 the increase in the total capital invested in blast furnaces was 95.75 per cent, while the investment in buildings and machinery has increased 275.49 per cent. There was a decrease of 3.04 per cent in the remaining items, the causes of this apparent decline having been previously explained.

EMPLOYÉS AND WAGES.—The following statement presents the average number and total wages of officers or firm members and clerks, and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, BLAST FURNACES IN THE SOUTHERN STATES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years. (a)		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	8,264	$3,416,278	8,225	$3,410,628	1	$360	38	$5,290
Officers or firm members	164	366,731	164	366,731	.....	.....	.....	.....
Clerks	168	132,389	167	132,029	1	360	.....	.....
Skilled	1,426	829,887	1,426	829,887	.....	.....	.....	.....
Unskilled	6,506	2,087,271	6,468	2,081,981	.....	.....	38	5,290

a Includes convict laborers in the Texas penitentiary receiving an average of 50 cents a day.

The following statement presents the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, BLAST FURNACES, IN THE SOUTHERN STATES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.	
	Males above 16 years. (a)	Children.
Total	7,894	38
Under $5	106	29
$5 and over but under $6	150	9
$6 and over but under $7	437	.....
$7 and over but under $8	2,232	.....
$8 and over but under $9	1,928	.....
$9 and over but under $10	942	.....
$10 and over but under $12	881	.....
$12 and over but under $15	735	.....
$15 and over but under $20	296	.....
$20 and over but under $25	111	.....
$25 and over	76	.....

a Includes convict laborers in the Texas penitentiary, receiving an average of 50 cents per day.

The average length of time during which the blast furnaces of the southern states were in operation in 1890 was 8.70 months. Furnace hands were employed 12 hours per day, 7 days each week; yard hands worked 10 hours daily for 6 days a week. In 1880 the blast furnaces of the south were in operation an average of 7.52 months.

The daily rates of wages of blast furnace employés in the south do not differ materially from the wages at most northern establishments. At the southern furnaces colored labor is almost exclusively employed, except in positions where judgment and prompt action in emergencies are required, such as those of founders, stovesmen, engineers, and head iron grader. In the cast house the iron breakers, helpers, keepers, cinder men, and scrap men are colored, one or two white men occasionally working on the shift. In the stock house the work from unloading the stock to the filling in at the top of the furnace is performed by colored labor, the employment of white labor being exceptional.

One of the difficulties encountered by the managers of southern furnaces in the employment of colored laborers is to secure continuous service. For this reason it is found necessary to divide the force into gangs with a "boss", whose duty it is to provide sufficient men to fill the places of those temporarily idle and keep the work moving smoothly. One "boss" looks after the men on the floor of the stock house, another after those engaged in unloading material, another after the cinder men, while still another takes charge of any laborers employed for extra work around the furnace.

In order to show the range of wages for different classes of blast furnace employés, the following statement has been prepared, showing the daily rates of wages paid by six blast furnace companies in the Birmingham, Ala., district in 1890:

DAILY RATES OF WAGES PAID AT 6 BLAST FURNACES IN THE BIRMINGHAM DISTRICT, ALABAMA: 1890.

CLASSES.	DAILY RATES OF WAGES.					
	Establishment. 1	Establishment. 2	Establishment. 3	Establishment. 4	Establishment. 5	Establishment. 6
Breakers	$1.20	$1.20	$1.00	$1.20	$1.20	$1.10
Ore and coke wheelers	1.35	1.70	1.20	1.20	1.35	1.10
Top fillers	1.75	1.75	1.75	1.75	1.75	1.50
Top fillers, helpers	1.50	1.25	1.50	1.50	1.50	1.25
Stove tenders	1.75	1.75	1.75	1.75	1.75	1.50
Weighers	2.00	1.70	1.30	1.20	2.00	1.50
Metal carriers	2.00	2.00	2.00	2.00	2.00	1.75
Founders (excluding boss founders)	2.75	2.16	3.00	3.00	3.00	2.83
Keepers	2.00	2.00	2.00	2.00	2.00	1.75
Engineers	2.50	1.80	2.25	2.25	2.25	2.00
Firemen	1.50	1.40	1.50	1.60	1.25	1.10
Common laborers	1.10	1.00	1.00	1.00	1.10	1.00

Slightly lower rates than those above given are paid at southern furnaces which are not located in close proximity to the large cities.

MATERIALS USED.—The following comparative statement presents the quantities and cost of the materials consumed by the blast furnaces in the southern states, as reported at the censuses of 1880 and 1890. The quantities reported are in tons of 2,000 pounds, except charcoal, which is stated in bushels.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, BLAST FURNACES IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Cost.	Quantity.	Cost.
Total		$4,452,864		$15,410,982
Domestic iron ore	724,136	2,003,250	3,837,409	6,042,537
Foreign iron ore	(a)		136,769	663,422
Fluxing material	259,564	208,114	1,154,006	766,938
Anthracite coal	32,600	139,000		
Bituminous coal	79,262	119,156	148,823	223,326
Coke	334,458	1,034,213	2,228,915	5,939,150
Charcoal	14,961,937	824,842	23,409,733	1,413,452
Mill cinder, etc	60,133	124,289	79,612	152,440
All other materials				209,717

a Domestic and foreign iron ore were not reported separately at the census of 1880.

With the exception of a few establishments in Maryland, West Virginia, and Kentucky, the furnaces of the south obtain their supply of ore from local sources, and almost the entire output of these mines is used by furnaces which are usually located in close proximity. In Maryland a number of furnaces use foreign ores, and in West Virginia almost all the pig iron is produced from Lake Superior ores. Kentucky also uses some ore from the Lake Superior district.

Coke constitutes the principal fuel used in the blast furnaces of the south, although the manufacture of charcoal pig iron continues to occupy an important position in the iron industry of this section. A few of the Kentucky furnaces still use a mixture of raw coal and coke, but in all other states where coke is used as a blast furnace fuel it is employed alone. The Virginia furnaces draw their supply of coke from the Flat Top and New River districts in Virginia and West Virginia. Those of Alabama and Tennessee depend largely on the coke made from coal mined in those states, although obtaining a part of their supply from the Flat Top district.

PRODUCTS.—The following comparative statement shows the quantity and value of pig iron, including castings direct from the furnace, as reported at the censuses of 1880 and 1890, according to fuel used. The quantities are in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF PRODUCTS CLASSIFIED ACCORDING TO KIND OF FUEL USED, BLAST FURNACES IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Tons.	Value.	Tons.	Value.
Total	.....	$7,769,050	.....	$22,494,870
Mixed anthracite and coke pig iron	26,100	590,000	.....	.....
Coke and bituminous pig iron	214,861	4,117,635	1,629,033	18,966,980
Charcoal pig iron	106,955	2,909,750	205,553	3,527,890
Anthracite coal pig iron	2,520	65,500	.....	.....
Total tonnage and value	a350,436	7,682,885	1,834,586	22,494,870
All other products	.....	86,165	.....	.....

a Six hundred and eighty-one tons of direct castings shown in the report for blast furnaces, 1880, have been distributed in this statement among the several kinds of pig iron.

While the furnaces of the south are advantageously located for the production of pig iron at low cost, the local development of industries consuming pig iron has not kept pace with the erection of furnaces, consequently at present a large part of the iron must seek purchasers in northern and western markets. The rolling mill industry is, however, steadily growing in the south, and increased activity is shown from year to year in the erection of foundries.

MACHINERY.—The majority of the furnaces abandoned during the past decade were of small capacity, and, owing to antiquated machinery or unfavorable location for supply of materials and marketing products, were unable to compete with the furnaces constructed during recent years.

The number of completed establishments has decreased from 119 in 1880 to 92 in 1890, the number of furnace stacks from 140 to 132, while the daily capacity has increased from 2,199 tons in 1880 to 8,511 tons in 1890.

The following comparative statement shows the number and total daily capacity in tons of 2,000 pounds of the blast furnaces in the southern states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, NUMBER AND TOTAL DAILY CAPACITY OF BLAST FURNACE STACKS IN THE SOUTHERN STATES: 1880 AND 1890.

STATES.	NUMBER OF COMPLETED FURNACE STACKS.		TOTAL DAILY CAPACITY.	
	1880	1890	1880	1890
Total	140	132	2,199	8,511
Alabama	15	48	339	4,237
Georgia	10	5	144	259
Kentucky	22	6	392	323
Maryland	22	14	281	713
North Carolina	7	1	39	15
Tennessee	21	19	388	1,109
Texas	1	3	10	130
Virginia	31	31	287	1,200
West Virginia	11	5	319	525

It appears from the foregoing statement that the increase during the decade in the total daily capacity of the blast furnaces in the southern states is 6,312 tons, or 287.04 per cent.

ROLLING MILLS AND STEEL WORKS.

Including active and idle establishments in 1880, there were situated in the southern states 34 iron rolling mills, 2 open hearth steel works, and 2 crucible steel works. Of the 40 establishments in 1890, 32 were iron and steel rolling mills not connected with steel producing works and 8 were equipped for the production of crude steel. These 8 steel works comprised 5 bessemer steel plants, 3 open-hearth steel plants, and 2 crucible steel plants. There was 1 establishment which operated both bessemer and open-hearth steel plants, and all but 1 establishment contained trains of rolls.

The following comparative summary exhibits the leading statistics of the rolling mills and steel works, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880	1890
Number of establishments	67	35	35
Capital	$4,592,310	$9,675,791	*c*$13,039,181
Miscellaneous expenses	(*d*)	(*d*)	$530,117
Average number of employés (aggregate)	5,150	9,748	9,277
Total wages	$2,943,009	$3,620,136	$4,219,322
Officers, firm members, and clerks:			
Average number	(*e*)	(*e*)	218
Total wages			$307,295
All other employés:			
Average numbers	(*e*)	(*e*)	9,059
Total wages			$3,912,027
Cost of materials used	$7,102,632	$9,038,048	$11,503,000
Value of products (*f*)	$13,332,071	$14,715,410	$17,312,282
Tons of products	157,228	256,406	457,278

a This statement includes only active establishments for the censuses of 1880 and 1890; such establishments were not reported separately at the census of 1870.
b See remarks in regard to the depreciated currency of 1870.
c Includes hired property valued at $500,000. This item was not reported separately at previous censuses.
d Not reported.
e Not reported separately.
f Includes values for which no tonnage was reported.

The following comparative statement presents the leading statistics relating to rolling mills and steel works in the southern states, by states and territories, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES, BY STATES AND TERRITORIES: 1880 AND 1890. (*a*)

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Southern States	1880	35	$9,675,791	9,748	$3,620,136	$9,038,048	$14,715,410
	1890	35	*b*13,039,181	*c*9,277	*c*4,219,322	11,503,000	17,312,282
Alabama	1880	1	50,000	60	18,000	25,400	47,500
	*d*1890						
District of Columbia	1880	1	89,600	18	7,528	2,264	10,970
	1890						
Georgia	1880	1	250,000	500	102,239	373,276	486,760
	*d*1890						
Kentucky	1880	9	2,512,000	2,205	914,412	2,422,389	3,841,377
	1890	5	1,484,456	1,205	628,658	1,241,536	2,059,840
Maryland	1880	5	2,145,000	1,253	546,974	1,829,042	2,550,051
	1890	4	1,071,352	573	211,009	766,849	1,062,204
Tennessee	1880	5	1,401,000	1,350	376,786	859,965	1,369,400
	1890	4	927,549	481	249,529	492,789	881,404
Virginia	1880	5	838,000	1,134	352,539	1,199,698	1,986,416
	1890	6	2,174,787	1,782	705,048	1,584,285	2,400,603
West Virginia	1880	8	2,390,191	3,228	1,301,658	2,326,014	4,422,936
	1890	8	5,012,842	3,409	1,639,276	6,402,189	8,547,360
All other states	*d*1890	8	2,368,195	1,827	785,802	1,015,352	2,360,871

a This statement includes only active establishments.
b Includes hired property valued at $500,000. This item was not reported separately at the census of 1880.
c Includes 218 officers, firm members, and clerks, with wages amounting to $307,295, distributed as follows: Alabama (including 1 establishment located in Georgia) 46, $60,598; Kentucky 32, $16,651; Maryland 16, $16,828; Tennessee 21, $30,830; Virginia 40, $65,701; West Virginia 63, $86,687. These classes were not reported separately at the census of 1880.
d Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Georgia 1; Alabama 7.

The state of West Virginia occupies the leading position in 1890 as regards both capital and value of products. The returns show that Alabama has more capital invested in rolling mills and steel works than Virginia, although the total value of products of the Virginia works, in 1890, slightly exceeded the total of Alabama. Texas had no rolling mill industry in 1880, but in 1890 contained 1 completed rolling mill (idle), and 1 in course of construction. In the remaining states a decrease in the amount of capital invested and in value of products is noted during the decade.

The southern states have made but little progress in the production of steel since 1880, the character of the iron ores of this section being generally unsuitable for use in the older and well-tried processes of steel manufacture. During 1890 steel was produced experimentally by the basic process at an open-hearth establishment in Alabama.(*a*) Since 1880 5 bessemer steel plants have been erected in the south, 4 of which were added to existing iron rolling mills. Of this number, 1 is in Virginia, 2 in West Virginia, and 2 in Tennessee. At the close of 1890, large steel works were in course of erection at Sparrow Point, Baltimore, Md., for the manufacture of steel by the bessemer process.(*b*)

In 1880 the south was credited with 2 open-hearth and 2 crucible steel works, but in 1890 the open-hearth steel plants had increased to 3, the number of crucible steel works remaining unchanged.

CAPITAL.—The following comparative statement shows the different items of capital in active and idle establishments and those in course of construction for rolling mills and steel works in the southern states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	39	$10,233,791	$6,102,700	$4,131,091
	1890	45	a14,567,374	8,074,283	6,493,091
Establishments in operation	1880	35	9,675,791	5,662,300	4,013,491
	1890	35	13,039,181	6,894,290	6,144,891
Idle establishments	1880	3	405,000	305,400	99,600
	1890	5	554,193	496,693	57,500
Establishments in course of construction	1880	1	153,000	135,000	18,000
	1890	5	974,000	683,300	290,700

a Includes hired property valued at $500,000. This item was not reported separately at the census of 1880.

Of the aggregate capital invested in rolling mills and steel works in 1880, $6,102,700 was credited to buildings and machinery, and the remaining $4,131,091 to land and cash capital. In the 10 years under consideration, the increase in aggregate capital was 42.35 per cent, while the value of buildings and machinery had increased 32.31 per cent and the investment in land and cash capital 57.18 per cent.

EMPLOYÉS AND WAGES.—The following statement presents the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés in rolling mills and steel works in the southern states, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
Total	9,277	$4,219,322	8,943	$4,169,341	1	$520	333	$49,461
Officers or firm members	102	215,251	102	215,251	.....	.....	.....	.....
Clerks	116	92,044	115	91,524	1	520	.....	.....
Skilled	4,967	2,782,641	4,967	2,782,641	.....	.....	.....	.....
Unskilled	4,092	1,129,386	3,759	1,079,925	.....	.....	333	49,461

a Since the close of the census year, an establishment in Chattanooga, Tenn., has engaged in the manufacture of steel by the same method.
b This establishment has since been completed and put in operation.

The following statement shows the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.	
	Males above 16 years.	Children.
Total	8 726	333
Under $5	156	208
$5 and over but under $6	481	109
$6 and over but under $7	812	16
$7 and over but under $8	954	.....
$8 and over but under $9	1,093	.....
$9 and over but under $10	1,008	.....
$10 and over but under $12	1,067	.....
$12 and over but under $15	925	.....
$15 and over but under $20	1,238	.....
$20 and over but under $25	643	.....
$25 and over	349	.....

During 1890 the rolling mills and steel works of the southern states were in operation an average of 8.72 months each, while the average term of employment for men was 9.34 months and for children 8.72 months. In rolling mills and steel works, with but few exceptions, the workmen are employed 10 hours a day for 6 days of the week. In 1880 the rolling mills and steel works of the south employed 9,748 hands and were in operation an average of 9.06 months each.

MATERIALS USED.—The following comparative statement presents the quantities and cost of materials consumed by the rolling mills and steel works in the southern states, as reported at the censuses of 1880 and 1890. The quantities are stated in tons of 2,000 pounds with the exception of charcoal, which is stated in bushels.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Cost.	Quantity.	Cost.
Total	.....	$9,038,048	.....	$11,503,000
Iron ore	30,738	220,191	32,238	214,746
Spiegeleisen and ferro-manganese	119	9,500	1,709	93,097
Pig iron	150,938	3,569,251	336,586	4,979,007
Old iron rails	88,903	2,474,493	42,271	998,657
Other old or scrap iron	44,758	1,165,138	43,311	796,190
Old steel rails	250	7,500	.....	.....
Other old or scrap steel	75	2,750	2,488	45,587
Hammered iron ore blooms	1,300	83,000	100	5,000
Hammered pig or scrap blooms	9,351	426,335	.....	.....
Purchased muck bar	199	7,403	3,816	119,059
Purchased bessemer steel	.....	.....	73,377	2,012,310
Purchased open-hearth steel	.....	.....	8,509	260,792
Swedish billets and bars	.....	.....	200	16,000
Anthracite coal	3,080	16,250	1,719	7,657
Bituminous coal	454,383	838,878	548,304	747,405
Coke	1,160	6,065	20,725	58,981
Charcoal	155,500	13,733	26,807	2,157
Natural gas	.....	.....	.....	24,075
All other materials	.....	197,561	.....	1,122,280

PRODUCTS.—The comparative statement on the following page shows the tonnage of iron and steel products for rolling mills and steel works in the southern states, as reported at the censuses of 1880 and 1890.

COMPARATIVE STATEMENT, TONNAGE OF PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880	1890
Total	256,406	457,278
Iron	253,311	208,977
Bessemer steel		241,365
Open-hearth steel	3,020	5,806
Crucible and miscellaneous steel	75	1,130

The following comparative statement presents the value of the different iron and steel products and the percentage that each class bears of the total, for the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, VALUE OF PRODUCTS, WITH PERCENTAGE EACH CLASS IS OF TOTAL, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	VALUE.		PERCENTAGE.	
	1880	1890	1880	1890
Total	$14,715,410	$17,312,282	100.00	100.00
Manufactures of iron	14,466,342	8,496,838	98.31	49.08
Manufactures of steel	171,000	8,619,508	1.16	49.79
Miscellaneous	78,068	195,936	0.53	1.13

The extent to which steel has superseded iron in the southern states during the decade from 1880 to 1890 is shown in the foregoing statement. In 1880 the tonnage of iron formed 98.79 per cent of the total output and steel but 1.21 per cent, while in 1890, the tonnage of iron formed 45.70 per cent of the total output and steel increased to 54.30 per cent. The value of iron products decreased 41.26 per cent and the tonnage 17.50 per cent.

The following comparative statement presents the tonnage and value of the classified products of the rolling mills and steel works of the southern states, as reported at the censuses of 1880 and 1890. The quantities are given in tons of 2,000 pounds, except nails, which are stated in kegs of 100 pounds.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF CLASSIFIED PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Quantity.	Value.	Quantity.	Value.
Total		$14,715,410		$17,312,282
Iron:				
Rails	52,086	2,371,770	4,314	168,081
Bar and rod	69,590	3,526,239	80,849	3,090,181
Hoop	1,537	102,855	291	12,804
Skelp	3,910	249,158		
Structural shapes	2,300	145,000	2,000	85,000
Sheets	12,302	982,595	17,159	1,053,469
Plates (except nail plates)	18,882	1,374,439	14,368	680,211
Car axles, rolled and hammered	300	21,000	5,900	282,182
Muck bar produced for sale	1,991	55,796	38,082	936,654
Cut nails	1,471,720	4,633,960	184,341	437,566
All other finished products	16,827	1,003,530	36,797	1,750,690
Steel, bessemer:				
Rails			536	20,000
Bar			5,265	214,085
Sheets			5,159	300,757
Skelp			4,289	146,183
Plates (except nail plates)			15,220	538,924
Cut nails			1,178,082	2,479,135
All other finished products			151,983	4,536,453
Steel, open-hearth:				
Rails	2,745	137,250		
Bar			2,504	100,458
Sheets			31	1,805
Plates			2,971	157,208
All other finished products	275	24,750	300	8,100
Steel, crucible:				
Finished products	75	9,000	1,130	115,500
All other products		78,068		195,936

The quantities of bars and rods include the bars and rods sold only in those forms. Where such material is converted into bolts, nuts, horseshoes, or other products by the same establishment, the quantities and values of these finished products are tabulated under the item of "All other finished products". Under the same heading are included the quantities and values of several important products made only by a single concern, the presentation of which under their proper classifications would disclose the operations of individual establishments. In the final tabulations for the whole country these products will be entered under the proper headings with similar products for other establishments.

The quantities and values of steel products include all manufactures either made from steel produced in this section or obtained from outside sources in the form of billets, slabs, or bars.

The most notable decline in the tonnage and values of iron products since 1880 has occurred in cut nails and rails. Wheeling, W. Va., has long been an important center of the nail industry of the United States, and the quantity of nails reported as made in the south in 1880 and 1890 was produced almost entirely at works located in this district. In 1890 bessemer steel formed the principal material used in the manufacture of cut nails and spikes, the aggregate quantity of iron and steel nails made in that year not being much below the total tonnage of iron nails made in 1880.

MACHINERY.—The following comparative statement presents the equipment and the total daily capacity of the rolling mills and steel works in the southern states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, EQUIPMENT AND CAPACITY, ROLLING MILLS AND STEEL WORKS IN THE SOUTHERN STATES: 1880 AND 1890. (*a*)

MACHINERY.	1880	1890	Increase.
Single puddling furnaces	516	503	*b*13
Heating furnaces	205	199	*b*6
Bessemer converters		8	8
Open-hearth furnaces	3	4	1
Crucible pots which can be used at each heat	34	44	10
Hammers	22	34	12
Cut nail machines	562	1,236	674
Trains of rolls	132	151	19
Aggregate daily capacity in tons of finished products	1,662	3,103	1,441

a Includes machinery in both active and idle establishments.
b Decrease.

FORGES AND BLOOMERIES.

In 1880 the southern states contained 49 establishments equipped for the production of pig and scrap blooms and blooms and bar iron direct from the ore. Most of these establishments produced bar iron, but the annual production was small. With the development of the rolling mill industry in the south and the extension of transportation facilities these primitive iron making establishments have one by one been abandoned. In 1890 but 4 establishments were reported in the southern states, all equipped for the production of blooms from pig and scrap iron, located as follows: Maryland, 2; Virginia, 1; Alabama, 1; and of these but 1, located in Maryland, was in operation.

WESTERN STATES, INCLUDING THE PACIFIC COAST STATES.

This grouping comprises all the states west of Pennsylvania which are not included in the classification of the "Southern states". The term "Western states" in these pages will be understood to embrace the Pacific coast states.

The comparative summary on the following page presents the leading statistics of the iron and steel industry of the western states, as reported at the censuses of 1870, 1880, and 1890.

COMPARATIVE SUMMARY, IRON AND STEEL INDUSTRY IN THE WESTERN STATES: 1870, 1880, AND 1890. (a)

ITEMS.	1870 (b)	1880 (b)	1890
Number of establishments	152	173	188
Capital	$25,306,448	$44,658,033	c$100,935,973
Miscellaneous expenses	(d)	(d)	4,366,411
Average number of employés (aggregate)	16,856	c37,361	42,469
Total wages	$9,220,381	c$14,828,506	$24,631,090
Officers, firm members, and clerks:			
Average number	(f)	(f)	1,092
Total wages			$1,611,062
All other employés:			
Average number	(f)	(f)	41,377
Total wages			$23,020,028
Cost of materials used	$25,519,539	$54,580,364	$91,713,354
Value of products (g)	$40,966,909	$78,508,424	$129,551,520
Tons of products	766,460	1,944,179	5,063,359

a This statement includes only active establishments for the censuses of 1880 and 1890; such establishments were not reported separately at the census of 1870.

b For explanation of apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.

c Includes hired property valued at $3,687,058. This item was not reported separately at previous censuses.

d Not reported.

e Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota and included in the totals published at the census of 1880; these employés were engaged in making repairs to plant.

f Not reported separately.

g Includes values for which tonnage was not reported.

The following comparative statement presents the leading statistics of the iron and steel industry of the western states, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, IRON AND STEEL INDUSTRY IN THE WESTERN STATES, BY STATES: 1880 AND 1890. (a)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Western States	b1880	173	$44,658,033	c37,361	c$14,828,506	$54,580,364	$78,508,424
	1890	188	d100,935,973	e42,469	e24,631,090	91,713,354	129,551,520
California	1880	1	1,000,000	319	177,722	535,500	780,000
	1890	4	4,656,611	1,152	749,849	1,948,333	3,097,155
Colorado	1880	1	100,000	125	7,300	131,700	225,000
	f1890						
Illinois	1880	16	5,795,620	5,253	2,508,718	14,977,145	20,545,293
	1890	24	34,689,919	8,864	5,490,191	30,039,674	39,011,051
Indiana	1880	12	2,283,000	2,048	864,921	3,293,073	4,551,403
	1890	15	4,099,095	2,717	1,254,161	3,075,056	4,742,760
Kansas	1880	2	450,000	630	166,500	734,245	1,004,100
	1890						
Michigan	1880	15	3,342,386	3,089	922,597	3,279,420	4,591,613
	1890	19	6,696,541	1,509	896,117	4,135,991	5,829,843
Missouri	1880	12	5,698,600	3,139	734,575	3,249,558	4,660,530
	1890	9	3,495,913	1,314	720,901	2,079,254	3,237,542
Nebraska	1880	1	100,000	100	50,000	114,500	82,000
	1890						
Ohio	1880	103	22,837,606	20,071	8,265,070	23,997,915	34,918,360
	1890	101	37,642,887	24,166	14,126,669	44,551,301	65,206,828
Oregon	1880	1	106,000	250	46,822	33,073	78,393
	f1890						
Wisconsin	1880	8	2,768,218	2,153	1,004,931	3,830,667	6,580,391
	1890	9	6,461,531	1,920	1,032,541	4,613,753	6,501,761
Wyoming	1880	1	212,603	184	79,650	403,568	491,345
	f1890						
All other states	f1890	7	3,193,476	827	360,661	1,279,992	1,524,580

a This statement includes only active establishments.

b For explanation of apparent discrepancies existing in the data for 1880, see remarks in regard to the inclusion of capital, employés, and wages relating to mining and other operations.

c Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota and included in the totals published at the census of 1880; these employés were engaged in making repairs to plant.

d Includes hired property valued at $3,687,058. This item was not reported separately at the census of 1880.

e Includes 1,092 officers, firm members, and clerks, and their wages amounting to $1,611,062, distributed as follows: California 38, $56,549; Illinois 179, $269,308; Indiana 69, $103,013; Michigan 82, $139,756; Missouri 45, $65,802; Ohio 620, $864,528; Wisconsin 30, $50,754; all other states 29, $61,352. These classes were not reported separately at the census of 1880.

f Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 2; Iowa, 1; Minnesota, 1; Oregon, 1; Washington, 1; Wyoming, 1.

The increase in the value of products is seen to have been very great from 1880 to 1890, although not proportionally so large as from 1870 to 1880. The aggregate value of products, however, does not reflect the actual increase in the volume of business so accurately as does the total tonnage of products, owing to the remarkable decline in the selling prices of iron and steel during the past 20 years.

CAPITAL.—The following comparative statement shows the different items of capital in active and idle establishments and those in course of construction for the iron and steel industry in the western states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, IRON AND STEEL INDUSTRY IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	231	*a*$52,318,593	$25,841,687	$26,476,906
	1890	233	*b*108,070,751	52,258,989	55,811,762
Establishments in operation	1880	173	44,658,033	23,165,138	21,492,895
	1890	188	100,935,973	47,014,287	53,921,686
Idle establishments	1880	52	6,967,188	2,676,549	4,290,639
	1890	37	6,508,478	4,805,202	1,703,276
Establishments in course of construction	1880	6	693,372	(*c*)	693,372
	1890	8	626,300	439,500	186,800

a See remarks in regard to inclusion of capital relating to mining and other operations in the figures for 1880.
b Includes hired property valued at $3,687,058. This item was not reported separately at the census of 1880.
c Not reported separately.

BLAST FURNACES.

With the development of the extensive deposits of the rich iron ores of the Lake Superior region, and the better facilities enjoyed for securing coke from the Connellsville region, the western states have fully maintained their relative rank among the other pig iron producing states. In 1880 the furnaces of the western states contributed 26.41 per cent of the total quantity of pig iron produced in the country that year, and in 1890 this section made 27.06 per cent of the total output, the small quantity of castings made direct from the furnaces being included in each year.

The following comparative summary presents the leading statistics of the blast furnace industry in the western states, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, BLAST FURNACES IN THE WESTERN STATES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880 (*b*)	1890
Number of establishments	101	93	84
Capital	$13,169,826	$21,697,190	*c*$33,986,675
Miscellaneous expenses	(*d*)	(*d*)	$1,490,247
Average number of employés (aggregate)	8,111	*e*14,202	7,919
Total wages	$4,018,539	*c*$4,158,208	$4,128,745
Officers, firm members, and clerks:			
Average number	(*f*)	(*f*)	296
Total wages			$413,046
All other employés:			
Average number	(*f*)	(*f*)	7,623
Total wages			$3,715,699
Cost of materials used	$11,420,353	$17,158,649	$30,938,275
Value of products	$18,789,173	*g*$24,684,885	*g*$39,611,312
Tons of products	522,161	998,535	2,680,803

a This statement includes only active establishments for the censuses of 1880 and 1890; such establishments were not reported separately at the census of 1870.
b For explanation of the apparent discrepancies in the data for 1870 and 1880, see remarks in regard to the depreciated currency of 1870; also in regard to the inclusion of capital, employés, and wages relating to mining and other operations in the figures for 1880.
c Includes hired property valued at $2 068,058. This item was not reported separately at previous censuses.
d Not reported.
e Does not include 180 employés, and $25,275 wages reported by an idle establishment in Minnesota and included in the totals published at the census of 1880; these employés were engaged in making repairs to plant.
f Not reported separately.
g Includes values for which tonnage was not reported.

The following comparative statement exhibits the leading statistics relating to the blast furnace industry of the western states, by states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, BLAST FURNACES IN THE WESTERN STATES, BY STATES: 1880 AND 1890. (a)

STATES.	Year.	Number of establishments.	Capital	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Western States	b1880	93	$21,697,190	c14,202	c$4,158,208	$17,158,649	$24,684,885
	1890	84	d33,986,675	e7,919	e4,128,745	30,938,275	39,611,312
Illinois	1880	3	950,000	498	185,054	1,762,609	2,391,850
	1890	5	9,855,274	1,431	919,145	8,088,153	10,138,310
Indiana	1880	3	455,000	308	54,840	335,606	460,535
	f1890						
Michigan	1880	13	2,671,386	2,164	561,870	2,091,224	3,145,062
	1890	15	5,259,001	732	416,334	2,935,233	3,982,278
Missouri	1880	4	2,450,000	1,185	227,111	1,685,124	2,275,017
	1890	5	1,883,470	654	298,966	1,247,688	1,716,983
Ohio	1880	62	13,002,586	8,944	2,725,157	9,149,620	13,038,193
	1890	46	11,750,497	4,224	2,057,127	15,696,665	19,800,268
Oregon	1880	1	100,000	250	46,822	33,073	78,393
	f1890						
Wisconsin	1880	7	2,068,218	853	357,354	2,101,393	3,295,835
	1890	8	3,546,340	611	307,041	2,378,006	3,114,892
All other states	f1890	5	1,692,093	267	130,132	592,530	858,581

a This statement includes only active establishments.

b For explanation of the apparent discrepancies in the data for 1880, see remarks in regard to inclusion of capital, employés, and wages relating to mining and other operations.

c Does not include 180 employés and $25,275 wages reported by an idle establishment in Minnesota and included in the totals published at the census of 1880; these employés were engaged in making repairs to plant.

d Includes hired property valued at $2,068,058. This item was not reported separately at the census of 1880.

e Includes 296 officers, firm members, and clerks, and their wages, amounting to $413,046, distributed as follows: Illinois 11, $23,115; Michigan 57, $95,312; Missouri 27, $37,763; Ohio, 167, $200,890; Wisconsin 16, $30,154; "All other states" 18, $25,812. These classes were not reported separately at the census of 1880.

f Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 1; Indiana, 2; Oregon, 1; Washington, 1.

Ohio continues to occupy the leading position among the western states in the production of pig iron. The erection at Chicago of a number of furnace stacks of large size and modern equipment has brought Illinois prominently forward as a manufacturer of pig iron, nearly the entire quantity of which is a high grade iron for steel making purposes. Since 1880 the manufacture of pig iron has been abandoned in Utah, and during the past 10 years Colorado and Washington have engaged in its manufacture. A charcoal furnace was put in operation in California in 1881, but it has made no pig iron since 1886, and is practically abandoned.

CAPITAL.—The following comparative statement shows the different items of capital in active and idle establishments and those in course of construction for the blast furnaces in the western states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, BLAST FURNACES IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	136	a$27,618,395	$10,661,467	$16,956,928
	1890	108	b36,681,060	16,286,370	20,394,690
Establishments in operation	1880	93	21,697,190	8,655,967	13,041,223
	1890	84	33,986,675	14,345,485	19,641,190
Idle establishments	1880	40	5,626,843	2,005,500	3,621,333
	1890	20	2,523,385	1,890,385	633,000
Establishments in course of construction	1880	3	294,372	(c)	294,372
	1890	4	171,000	50,500	120,500

a See remarks in regard to inclusion of capital relating to mining and other operations in the figures for 1880.

b Includes hired property valued at $2,068,058. This item was not reported separately at the census of 1880.

c Not reported separately.

EMPLOYÉS AND WAGES.—The following statement presents the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, BLAST FURNACES IN THE WESTERN STATES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	7,919	$4,128,745	7,912	$4,126,405	4	$1,560	3	$780
Officers or firm members	150	306,311	150	306,311				
Clerks	146	106,735	142	105,175	4	1,560		
Skilled	2,052	1,291,902	2,052	1,291,902				
Unskilled	5,571	2,423,797	5,568	2,423,017			3	780

The following statement presents the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, BLAST FURNACES IN THE WESTERN STATES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.	
	Males above 16 years.	Children.
Total	7,620	3
Under $5	14	
$5 and over but under $6	45	3
$6 and over but under $7	327	
$7 and over but under $8	459	
$8 and over but under $9	1,133	
$9 and over but under $10	1,173	
$10 and over but under $12	2,041	
$12 and over but under $15	1,566	
$15 and over but under $20	609	
$20 and over but under $25	196	
$25 and over	57	

The average length of time during which the blast furnace establishments of the western states were in operation in 1890 was 9.44 months each, and the average term of employment for labor was 10 months. In 1880 the blast furnace establishments of this section were in operation an average of 8.65 months each.

MATERIALS USED.—The following comparative statement presents the quantity and cost of the materials consumed by the blast furnaces of the western states, as reported at the censuses of 1880 and 1890. The quantities are stated in tons of 2,000 pounds, except for charcoal, which is given in bushels.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, BLAST FURNACES IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Cost.	Quantity.	Cost.
Total		$17,158,649		$30,938,275
Domestic iron ore	1,697,233	9,308,784	4,123,773	17,637,721
Foreign iron ore	(a)	(a)	11,508	62,552
Fluxing material	624,508	621,395	1,048,873	859,154
Anthracite coal	32,517	186,908	45	141
Bituminous coal	756,642	1,456,243	351,199	456,791
Coke	688,108	3,240,489	2,320,046	8,288,103
Charcoal	28,295,478	1,977,702	35,841,190	2,438,186
Mill cinder	137,366	366,284	336,561	954,521
All other materials		784		241,106

a Domestic and foreign iron ore were not reported separately at the census of 1880.

The more careful selection of the material consumed in the manufacture of pig iron in 1890 is well illustrated in the increased yield of metal from ores. In 1880 the furnaces of the western states are reported to have used a total of 1,697,233 tons of iron ore and 137,366 tons of mill cinder, roll scale, and other materials, producing 998,535 tons of products, an average yield of metal to the ton of these materials consumed of 54.43 per cent. In 1890 the consumption of iron ore was 4,135,281 tons, and of mill cinder and roll scale 336,561 tons. The production of pig iron and other products during the year amounted to 2,680,803 tons, showing an average yield of metal per ton of materials above mentioned of 59.95 per cent. These quantities are all in tons of 2,000 pounds.

PRODUCTS.—The following comparative statement shows the quantity and value of pig iron, including castings direct from the furnace according to fuel used, produced by the blast furnaces of the western states, as reported at the censuses of 1880 and 1890. The quantities are in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF PRODUCTS CLASSIFIED ACCORDING TO KIND OF FUEL USED, BLAST FURNACES IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Tons.	Value.	Tons.	Value.
Total		$24,684 885		$39,611,312
Mixed anthracite and coke pig iron	124,388	3,114,855		
Coke and bituminous pig iron	628,024	14,631,077	2,289,307	32,797,716
Charcoal pig iron	246,123	6,706,257	391,496	6,809,871
Total tonnage and value	998,535	24,452,189	2,680,803	39,607,587
All other products		232,696		3,725

In 1880 there were produced 1,189 tons of direct furnace castings, and in 1890 273 tons. These have been distributed in this statement in accordance with the kind of fuel used. Included in the quantity of coke and bituminous coal pig iron in 1890 are 22,387 tons of spiegeleisen, produced by furnaces in Colorado and Illinois. No spiegeleisen was made in the western states in 1880.

MACHINERY.—The following comparative statement shows the number and total daily capacity in tons of 2,000 pounds of the furnaces in the western states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, NUMBER AND TOTAL DAILY CAPACITY OF BLAST FURNACE STACKS IN THE WESTERN STATES: 1880 AND 1890.

STATES.	NUMBER OF COMPLETED FURNACE STACKS.		TOTAL DAILY CAPACITY.	
	1880	1890	1880	1890
Total	179	137	6,013	11,595
Colorado		2		220
Illinois	10	15	603	2,772
Indiana	4	2	73	60
Michigan	27	26	844	1,216
Minnesota	1	1	40	150
Missouri	17	8	749	550
Ohio	103	71	3,201	5,713
Oregon	1	1	12	42
Utah	2		18	
Washington		1		30
Wisconsin	14	10	473	842

From the above statement it will be seen that the total number of blast furnaces in the western states has decreased by 42 stacks from 1880 to 1890. Ohio exhibits the largest decrease, 103 stacks being credited to that state in 1880, as compared with 71 at the close of the census year 1890. During the past 10 years the furnaces in Missouri have declined in number from 17 to 8 and the Wisconsin furnaces from 14 to 10. These figures, however, only show the net decrease in the number of furnaces, as many modern charcoal and coke furnaces have been built in these as well as in other states during the past 10 years to take the place of the larger number, but far less efficient furnaces, which have been abandoned. The effect of the building of these new and improved furnaces, the remodeling and equipping of the older stacks with more powerful blowing machinery and better stoves, the more general use of coke as a blast furnace fuel in place of bituminous coal, and the substitution of high grade ore for

the local deposits so largely employed at the date of the Tenth Census, is clearly shown in the increase which has taken place in the total capacity of the furnaces in the 10 years. In 1880 the 179 furnaces reported a daily capacity of 6,013 net tons, while the 137 furnaces in 1890 reported a daily capacity of 11,595 net tons.

ROLLING MILLS AND STEEL WORKS.

Of the 88 active and idle rolling mills and steel works located in the western states in the census year 1880, 74 were classed as iron rolling mills, 11 as bessemer and open-hearth steel works, and 3 as crucible steel works. The 11 bessemer and open-hearth steel establishments comprised 5 bessemer and 6 open-hearth steel making plants. In 1880 the rolling of steel was confined almost entirely to establishments which produced the crude material. With the more extended use of steel during the succeeding years many of the iron rolling mills rapidly adapted their machinery for rolling steel as well as iron.

The 121 active and idle establishments situated in the western states in 1890 consisted of 85 iron and steel rolling mills not connected with steel producing works, and 36 establishments which were equipped for the manufacture of crude steel. These 36 establishments comprised 20 bessemer steel plants (including 1 Clapp-Griffiths and 3 Robert-Bessemer plants), 17 open-hearth steel plants, and 6 crucible steel plants. There were 4 of the establishments equipped for producing both bessemer and open-hearth steel, and 3 for making both open-hearth and crucible steel. With the exception of 7 establishments, all the steel producing works contained trains of rolls.

The following comparative summary presents the leading statistics concerning the rolling mills and steel works in the western states, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1870, 1880, AND 1890. (*a*)

ITEMS.	1870 (*b*)	1880	1890
Number of establishments	49	77	104
Capital	$12,082,622	$22,732,243	*c*$66,949,298
Miscellaneous expenses	(*d*)	(*d*)	$2,876,164
Average number of employés (aggregate)	8 595	22,994	34,550
Total wages	$5,155,092	$10,610,298	$20,502,345
Officers, firm members, and clerks:			
Average number	(*e*)	(*e*)	796
Total wages			$1,198 016
All other employés:			
Average number	(*e*)	(*e*)	33,754
Total wages			$19,304,329
Cost of materials used	$13,967,436	$37,270,215	$60,775,079
Value of products (*f*)	$21,981,736	$53,623,539	$89,940,208
Tons of products	242,119	941,644	2 382 536

a This statement includes only active establishments for the censuses of 1880 and 1890; such establishments were not reported separately at the census of 1870.
b See remarks in regard to the depreciated currency of 1870.
c Includes hired property valued at $1,619,000. This item was not reported separately at previous censuses.
d Not reported.
e Not reported separately.
f Includes values for which tonnage was not reported.

During the period from 1880 to 1890 the tonnage of products increased 153.02 per cent, although the percentage of increase in the total value of finished products, owing to the decline in the selling prices of iron and steel, was only 67.73.

The following comparative statement presents the leading statistics of the rolling mills and steel works of the western states, by states, as reported at the censuses of 1880 and 1890.

COMPARATIVE STATEMENT, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES, BY STATES: 1880 AND 1890. (*a*)

STATES.	Year.	Number of establishments.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Cost of materials used.	Value of products.
				Employés.	Wages.		
The Western States	1880	77	$22,732,243	22,994	$10,610,298	$37,270,215	$53,623,539
	1890	104	*b*66,949,298	*c*34,550	*c*20,502,345	60,775,079	89,940,208
California	1880	1	1,000,000	319	177,722	535,500	780,000
	1890	4	4,656,611	1,152	749,849	1,938,333	3,097,155
Colorado	1880	1	100,000	125	7,000	131,700	225,000
	*d*1890						
Illinois	1880	13	4,845,620	4,755	2,323,664	13,214,536	18,153,439
	1890	19	24,834,645	7,433	4,571,046	21,951,521	28,872,741
Indiana	1880	9	1,828,000	1,740	810,081	2,957,467	4,090,868
	1890	13	3,888,254	2,644	1,215,792	2,889,615	4,505,536
Kansas	1880	2	450,000	630	166,500	734,245	1,004,100
	1890						
Michigan	1880	2	671,000	925	360,727	1,188,196	1,446,551
	1890	4	1,437,540	777	479,783	1,200,758	1,847,565
Missouri	1880	5	3,020,000	1,789	447,464	1,412,934	2,185,513
	1890	4	1,612,443	660	421,935	831,566	1,520,559
Nebraska	1880	1	100,000	100	50,000	114,500	82,000
	1890						
Ohio	1880	41	9,805,020	11,127	5,539,913	14,848,295	21,880,167
	1890	55	25,892,390	19,942	12,089,542	28,854,636	45,406,560
Wisconsin	1880	1	700,000	1,300	647,577	1,729,274	3,284,556
	*d*1890						
Wyoming	1880	1	212,603	184	79,650	403,568	491,345
	*d*1890						
All other states	*d*1890	5	4,627,415	1,942	994,398	3,108,650	4,690,092

a This statement includes only active establishments.

b Includes hired property valued at $1,619,000. This item was not reported separately at the census of 1880.

c Includes 796 officers, firm members, and clerks, and their wages amounting to $1,198,016, distributed as follows: California 38, $56,549; Illinois 168 $246,193; Indiana 63, $95,013; Michigan 25, $44,444; Missouri 18, $28,039; Ohio 453, $663,638; all other states 31, $64,140. These classes were not reported separately at the census of 1880.

d Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 1; Iowa, 1; Minnesota, 1; Wisconsin, 1; Wyoming, 1.

Very few changes have taken place in the relative rank of the different states since 1880. Ohio continues to occupy the leading position, with Illinois second. Next to these two states California has shown the greatest development during the past decade. The prominence of Illinois as an iron and steel producing state is due to the establishment of an extensive bessemer steel industry. In 1890, 82.55 per cent of the total tonnage of iron and steel produced in this state was sold in the form of bessemer steel, principally rails. Ohio is a large producer of sheets, plates, nails, and other of the more highly finished forms of iron and steel, so that the total cost of the labor in that state bears a greater ratio to the total value of the products than is the case with most of the other states. In 1880 this state was a large producer of bessemer steel rails, but has since practically abandoned this branch of manufacture. The decline in the value of products in Missouri during the past decade is caused in part by the lower prices prevailing in 1890 than in 1880.

CAPITAL.—The following statement shows the different items of capital in active and idle establishments and those in course of construction, rolling mills and steel works in the western states, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, DISTRIBUTION OF CAPITAL IN ACTIVE AND IDLE ESTABLISHMENTS AND THOSE IN COURSE OF CONSTRUCTION, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF ESTABLISHMENTS.	Year.	Number of establishments.	CAPITAL.		
			Total.	Buildings, machinery, tools, and implements.	Land, stock, and finished products on hand, cash and bills receivable.
Total	1880	91	$24,441,598	$15,015,220	$9,426,378
	1890	125	a71,389,691	35,972,619	35,417,072
Establishments in operation	1880	77	22,732,243	14,374,171	8,358,072
	1890	104	66,949,298	32,668,802	34,280,496
Idle establishments	1880	11	1,310,355	641,049	669,306
	1890	17	3,985,093	2,914,817	1,070,276
Establishments in course of construction	1880	3	399,000	(b)	399,000
	1890	4	455,300	389,000	66,300

a Includes hired property valued at $1,619,000. This item was not reported separately at the census of 1880.
b Not reported separately.

In the 10 years from 1880 to 1890 the figures indicate that the value of buildings and machinery increased 139.57 per cent, and the investment in land and cash capital 275.72 per cent.

EMPLOYÉS AND WAGES.—The following statement presents the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés at the rolling mills and steel works of the western states, as reported at the census of 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES, BY CLASSES, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	34,550	$20,502,345	34,007	$20,377,847	26	$10,796	517	$113,702
Officers or firm members	237	667,463	237	667,463	.....	.....	.....	.....
Clerks	559	530,553	547	523,605	12	6,948	.....	.....
Skilled	19,299	13,859,975	19,222	13,836,385	2	1,040	75	22,550
Unskilled	14,455	5,444,354	14,001	5,350,394	12	2,808	442	91,152

The following statement shows the average number of employés at the different weekly rates of wages:

AVERAGE NUMBER OF SKILLED AND UNSKILLED EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	33,223	14	517
Under $5	350	12	215
$5 and over but under $6	509	.....	66
$6 and over but under $7	862	.....	226
$7 and over but under $8	3,675	.....	10
$8 and over but under $9	4,027	.....	.....
$9 and over but under $10	4,061	.....	.....
$10 and over but under $12	4,583	2	.....
$12 and over but under $15	5,347	.....	.....
$15 and over but under $20	3,852	.....	.....
$20 and over but under $25	3,496	.....	.....
$25 and over	2,461	.....	.....

The rolling mills and steel works of the western states were in operation an average of 9.40 months each during the census year 1890. The average term of employment for men was 10.11 months and for children 9.55 months. The establishments reporting for 1880 employed 22,994 hands, and were in operation an average of 9.09 months each.

MATERIALS USED.—The following comparative statement presents the total quantity and cost of the various raw materials consumed by the rolling mills and steel works of the western states, as reported at the censuses of 1880 and 1890. With the exception of charcoal, which is given in bushels, and oil for fuel, which is given in barrels, all the quantities are reported in tons of 2,000 pounds.

COMPARATIVE STATEMENT, QUANTITY AND COST OF MATERIALS USED, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF MATERIALS.	1880		1890	
	Quantity.	Cost.	Quantity.	Cost.
Total		$37,270,215		$60,775,079
Iron ore	75,484	623,441	126,085	711,872
Spiegeleisen and ferro-manganese	29,979	1,113,629	64,301	2,085,170
Pig iron	677,853	16,360,300	1,799,643	27,523,482
Old iron rails	324,111	9,824,691	244,625	5,565,210
Other old or scrap iron	122,064	3,161,899	365,532	6,260,580
Old steel rails and steel rail ends	41,026	1,255,473	28,769	590,642
Other old or scrap steel	24,649	712,870	163,190	2,598,474
Hammered iron ore blooms	6,383	350,635	1,051	32,490
Hammered pig or scrap blooms	831	21,802	2,042	57,038
Purchased muck bar	4,790	208,800	13,500	340,094
Purchased bessemer steel	700	56,000	251,799	7,123,760
Purchased open-hearth steel			2,589	99,617
Swedish billets and bars	80	6,400	114	9,420
Anthracite coal	1,497	9,764		
Bituminous coal	1,367,170	3,078,627	2,232,207	3,300,659
Coke	47,417	268,854	150,648	580,593
Charcoal	361,900	33,205	211,806	18,465
Oil for fuel			1,666,165	942,889
Natural gas for fuel				151,403
All other materials		183,825		2,783,221

A number of rolling mills and steel works in the western states used crude oil or natural gas for fuel during the census year 1890. The establishments using natural gas were situated in Ohio and Indiana, those in the eastern part of Ohio receiving the gas from wells in Pennsylvania, while those in the western part of the state and in Indiana were supplied from local wells. With the development of the Indiana gas field, a number of iron and steel establishments have been built in the vicinity of the wells, the offer of free gas being the inducement for the erection of these establishments. The amount reported in the above tables as the cost of natural gas used for fuel does not, therefore, cover the entire consumption of gas by rolling mills and steel works in the western states.

PRODUCTS.—The following comparative statement shows the tonnage of iron and steel products for rolling mills and steel works in the western states, as reported at the census of 1880 and 1890:

COMPARATIVE STATEMENT, QUANTITY OF PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880	1890
Total	941,644	2,382,536
Iron	616,661	967,655
Bessemer steel	302,605	1,344,511
Open-hearth steel	21,888	67,215
Crucible steel	490	3,155

The following comparative statement presents the values of the different iron and steel products and the percentage that each class bears of the total, for the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, VALUE OF PRODUCTS, WITH PERCENTAGE EACH CLASS IS OF TOTAL, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	VALUE.		PERCENTAGE.	
	1880	1890	1880	1890
Total	$53,623,539	$89,940,208	100.00	100.00
Manufactures of iron	33,796,762	38,683,070	63.03	43.01
Manufactures of steel	19,745,030	50,576,455	36.82	56.23
Miscellaneous products	81,747	680,683	0.15	0.76

The increase in the tonnage of products during the past 10 years was 1,440,892 tons, or 153.02 per cent. This growth has been principally in steel, iron products having increased only 56.92 per cent, while the steel products increased 335.37 per cent. In 1880 iron constituted 65.49 per cent of the total production and steel 34.51 per cent, while in 1890 the output of steel products was 59.39 per cent and the iron products 40.61 per cent of the total production of that year. The small quantity of Clapp-Griffiths and Robert-Bessemer steel made in 1890 is included in the output of bessemer steel.

The following comparative statement presents the classified tonnage and value of the products of the rolling mills and steel works of the western states, so far as they can be separately enumerated, as reported at the censuses of 1880 and 1890. Quantities are given in tons of 2,000 pounds, except for nails, which are stated in kegs of 100 pounds.

COMPARATIVE STATEMENT, QUANTITY AND VALUE OF CLASSIFIED PRODUCTS, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1880 AND 1890.

CLASS OF PRODUCTS.	1880		1890	
	Quantity.	Value.	Quantity.	Value.
Total	.....	$53,623,539	.....	$89,940,208
Iron:				
Rails	216,213	10,170,168	8,476	358,553
Bar and rod	232,079	12,585,563	619,652	22,580,807
Hoop	23,149	1,397,375	27,778	1,134,750
Skelp	1,000	50,000	28,377	1,088,648
Structural shapes	485	35,100	3,970	192,500
Sheets	22,123	1,657,973	50,174	3,014,723
Plates, except nail plates	20,884	1,423,528	20,706	942,390
Hammered car axles	13,078	934,487	22,086	1,020,445
Muck bar produced for sale	5,954	224,890	42,412	1,168,673
Cut nails	1,277,240	4,033,978	318,360	837,938
All other finished products	17,834	1,283,700	128,106	6,343,643
Steel, bessemer:				
Rails	272,766	15,642,130	639,524	17,930,826
Bar and rod	23,339	1,569,635	52,108	1,629,395
Hoop	.....	.....	2,780	122,903
Structural shapes	.....	.....	4,937	217,228
Sheets	.....	.....	21,269	1,324,347
Plates, except nail plates	.....	.....	15,895	820,178
Hammered car axles	.....	.....	8,836	493,282
Cut nails	.....	.....	1,784,664	3,700,461
Wire rods	.....	.....	102,102	4,003,921
Wire	.....	.....	87,521	5,044,502
All other finished products	6,500	650,000	320,297	10,585,999
Steel, open-hearth:				
Bar	11,647	810,602	20,549	986,360
Structural shapes	80	8,800	2,286	136,690
Sheets	650	64,955	2,260	202,140
Plates, except nail plates	5,176	662,840	19,146	1,350,397
Hammered car axles	.....	.....	1,886	178,534
Cut nails	.....	.....	9,340	42,630
All other finished products	4,335	288,468	20,621	1,496,562
Steel, crucible:				
Finished products	490	47,600	3,155	310,130
All other products	.....	81,747	.....	680,683

The quantities and value of bar and rod iron and steel include only the bars and rods sold in that form. Where bars and rods are converted into bolts, nuts, and other products by the same establishment the quantities and values are included under the heads of "All other finished" iron, bessemer, or open-hearth steel products.

The larger part of the wire rods produced in 1890 were finished into wire and other products at the establishments where they were rolled. As the rods so consumed are an intermediate product the quantities and value of the articles made from them are alone included in the above statement, under the head of "All other finished products." The same is true of the bessemer steel wire reported, this item including only the wire sold in this form. The quantity and value of the wire nails produced by the rolling mills and steel works of the western states in 1890 are included under the head of "All other" finished bessemer steel products. A large number of the wire nail works in this and other sections of the country roll neither iron nor steel, but purchase the rods or wire consumed by them, and their products are therefore not included in the presentation of the operations of rolling mills and steel works.

During the census year 1880 the rolling mills and steel works of the western states produced 344,734 net tons of bessemer steel ingots and direct castings, 25,637 net tons of open-hearth steel ingots, and 490 tons of crude steel, while in 1890 the works of this section produced 1,273,425 tons of bessemer steel ingots (including 1,802 tons of Clapp-Griffiths steel and 4,330 tons of Robert-Bessemer steel), 73,732 tons of open-hearth steel, and 2,533 tons of crucible steel.

Notwithstanding that the total tonnage of products has increased in the 10 years from 941,644 net tons in 1880 to 2,382,536 net tons in 1890, or 153.02 per cent, the increase in the total value of products has been from $53,623,539 to $89,940,208, or only 67.73 per cent. The expansion of the manufacture of bessemer steel has been an important factor in the largely increased tonnage since 1880, and also in the decreased prices of the various iron and steel products. The average selling price of all products has declined from $56.86 a net ton in 1880 to $37.46 in 1890.

Crude steel was produced and rolled in 3 states only in 1880. In 1890 California, Colorado, Illinois, Indiana, Michigan, Missouri, and Ohio contained steel producing works, and in addition Wisconsin rolled products from steel obtained from Illinois.

MACHINERY.—The following comparative statement presents the equipment and capacity of the rolling mills and steel works of the western states, as reported at the censuses of 1880 and 1890, with the increase during the decade:

COMPARATIVE STATEMENT, EQUIPMENT AND CAPACITY, ROLLING MILLS AND STEEL WORKS IN THE WESTERN STATES: 1880 AND 1890. (*a*)

MACHINERY.	1880	1890	Increase.
Single puddling furnaces	958	1,142	184
Heating furnaces	577	674	97
Bessemer converters	10	37	27
Open-hearth furnaces	12	38	26
Crucible pots which can be used at each heat	71	116	45
Hammers	88	139	51
Cut nail machines	771	2,409	1,638
Trains of rolls	300	406	106
Aggregate daily capacity in finished products (net tons)	6,550	14,153	7,603

a Includes machinery in both active and idle establishments.
b Includes 2 Clapp-Griffiths and 4 Robert-Bessemer converters.

FORGES AND BLOOMERIES.

In 1880 the western states contained 4 forges and bloomeries for the production of charcoal blooms from iron ore or pig iron. These establishments reported a capital of $258,600, 165 employés to whom $60,000 in wages were paid, consuming materials costing $151,500, and produced blooms valued at $200,000. Since 1880 all of these works have been abandoned for iron making purposes.

GENERAL TABLES.

The following statements present in detail the statistics for the iron and steel industry, as reported at the census of 1890, by totals for the United States and for each state having 3 or more establishments. States having less than 3 establishments are grouped in order to avoid disclosing the operations of individual establishments. In connection with each table there is an exhibit showing by states the capital invested in idle establishments, together with the equipment and machinery of the same. Only such idle establishments are included as will probably be put into operation at some future period. Table 1 presents the statistics relating to blast furnaces; Table 2, those relating to rolling mills and steel works, and Table 3 the statistics of forges and bloomeries.

TABLE 1.—DETAILED STATEMENT,

	STATES.	Number of establishments.	CAPITAL. Value of hired property.	Direct investment. Total.	Land.	Buildings, machinery, tools, and implements.	Live assets (a)	Miscellaneous expenses. (b)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. Aggregates. Average number.	Total wages.
1	The United States.	304	$5,061,058	$129,547,485	$9,799,199	$67,292,490	$52,455,796	$6,342,675	34,483	$16,226,145
2	Alabama	28	108,000	15,670,786	1,386,281	11,014,644	3,269,861	932,227	4,139	1,783,700
3	Connecticut	5	.....	940,092	108,136	374,794	457,162	39,496	129	66,881
4	Georgia	4	.....	748,845	52,000	550,000	146,845	52,770	269	64,676
5	Illinois	5	425,000	9,430,274	425,000	3,786,970	5,218,304	215,252	1,431	919,145
6	Kentucky	4	.....	826,199	40,600	442,000	343,599	49,655	278	105,520
7	Maryland	5	.....	3,108,222	260,000	2,140,202	708,020	23,830	639	151,342
8	Michigan	15	.....	5,259,001	461,692	1,412,429	3,384,880	271,067	732	416,334
9	Missouri	5	275,000	1,608,470	152,000	554,471	901,999	73,138	654	298,966
10	New Jersey	8	.....	3,131,366	522,000	1,536,141	1,073,225	129,384	655	282,538
11	New York	16	300,000	6,143,208	327,194	3,249,955	2,566,059	349,788	1,462	672,288
12	Ohio	46	1,071,500	10,678,997	946,150	4,480,130	5,252,717	740,283	4,224	2,057,127
13	Pennsylvania	116	1,910,000	57,411,570	4,344,824	29,893,560	23,173,186	2,684,671	15,967	7,645,715
14	Tennessee	11	.....	3,685,806	129,500	2,331,975	1,224,331	185,574	1,076	525,992
15	Virginia	15	675,000	3,481,206	272,768	1,943,446	1,264,992	273,278	1,328	558,312
16	West Virginia	4	.....	1,446,082	81,000	717,830	647,252	59,143	424	198,933
17	Wisconsin	8	296,558	3,249,782	154,854	1,376,952	1,717,976	175,405	611	307,041
18	All other states (c)	9	.....	2,727,579	135,200	1,486,991	1,105,388	87,714	465	191,635

	STATES.	WEEKLY RATES OF WAGES PAID, AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, EXCLUDING OFFICERS, FIRM MEMBERS AND CLERKS. Aggregates. Average number.	Total wages.	Males above 16 years. Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Children. Total number.	Under $5.	$5 and over but under $6.
1	The United States.	33,415	$14,614,458	33,341	235	269	2,163	4,867	5,613	6,351	6,576	4,722	1,739	541	245	74	46	28
2	Alabama	3,989	1,521,304	3,962	11	56	169	767	1,235	407	561	468	180	62	46	27	18	9
3	Connecticut	117	50,634	117	.....	.....	.....	31	18	39	16	6	1	.....	6	.....	.....	.....
4	Georgia	254	45,501	254	.....	.....	2	145	49	20	17	9	9	2	1	.....	.....	.....
5	Illinois	1,420	896,030	1,420	.....	.....	.....	.....	96	4	456	479	256	110	19	.....	.....	.....
6	Kentucky	262	88,482	262	1	2	.....	25	84	82	21	29	13	4	1	.....	.....	.....
7	Maryland	630	143,812	630	2	12	7	353	96	67	75	12	4	1	1	.....	.....	.....
8	Michigan	675	321,022	675	.....	.....	.....	25	190	155	144	122	14	10	15	.....	.....	.....
9	Missouri	627	261,203	627	14	7	55	31	74	176	173	62	29	4	2	.....	.....	.....
10	New Jersey	640	240,152	635	4	9	52	162	82	88	126	71	27	9	5	5	2	3
11	New York	1,410	581,107	1,408	.....	2	46	163	225	247	360	273	55	24	13	2	2	.....
12	Ohio	4,057	1,856,237	4,054	.....	34	242	348	715	657	1,068	749	187	42	12	3	.....	3
13	Pennsylvania	15,612	7,084,308	15,586	111	61	1,298	1,813	2,204	3,838	3,131	2,070	771	201	88	26	13	13
14	Tennessee	1,012	438,376	1,012	3	.....	41	447	219	120	68	58	20	21	15	.....	.....	.....
15	Virginia	1,268	478,105	1,257	19	50	218	471	173	168	51	60	24	14	9	11	11	.....
16	West Virginia	411	182,175	411	.....	.....	.....	24	72	78	84	99	46	7	1	.....	.....	.....
17	Wisconsin	595	276,887	595	.....	.....	24	48	50	172	137	85	51	23	5	.....	.....	.....
18	All other states	436	149,123	436	70	36	9	14	31	33	88	70	72	7	6	.....	.....	.....

a Includes raw materials, stock in process and finished products on hand, and cash, bills and accounts receivable, and sundry items of capital not elsewhere reported.

b Includes rent, taxes, insurance, interest paid on cash used in the business, and all sundries not elsewhere reported.

BLAST FURNACES, BY STATES: 1890.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.

Officers or firm members actively engaged in the industry or in supervision.		Clerks.				Operatives and skilled.		Unskilled.				
Males above 16 years.		Males above 16 years.		Females above 15 years.		Males above 16 years.		Males above 16 years.		Children.		
Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
506	$1,174,212	555	$434,465	7	$3,010	9,094	$5,261,191	24,247	$9,339,467	74	$13,800	1
68	183,672	82	78,724	.....	.....	701	443,386	3,261	1,074,528	27	3,390	2
7	12,000	5	4,247	.....	.....	39	19,633	78	31,001	.....	.....	3
10	16,600	5	2,575	.....	.....	44	15,125	210	30,376	.....	.....	4
4	17,500	7	5,615	.....	.....	525	429,628	895	466,402	.....	.....	5
11	14,031	5	3,007	.....	.....	31	17,096	231	71,386	.....	.....	6
3	4,300	6	3,230	.....	.....	113	34,695	517	109,117	.....	.....	7
37	80,470	19	14,542	1	300	267	157,161	408	163,861	.....	.....	8
12	28,523	15	9,240	.....	.....	127	71,358	500	189,845	.....	.....	9
7	17,450	8	4,936	.....	.....	257	127,018	378	111,891	5	1,243	10
27	71,447	25	19,734	.....	.....	514	263,215	894	317,515	2	377	11
76	135,610	89	64,380	2	900	818	454,090	3,236	1,401,367	3	780	12
147	393,773	206	166,544	2	1,090	4,769	2,716,221	10,817	4,361,977	26	6,110	13
28	66,640	35	20,616	1	360	154	106,944	858	331,432	.....	.....	14
32	59,950	28	20,257	.....	.....	215	125,154	1,042	351,051	11	1,900	15
8	13,738	5	3,020	.....	.....	162	83,307	249	98,868	.....	.....	16
9	23,500	6	6,294	1	360	207	130,369	388	146,518	.....	.....	17
20	35,008	9	7,504	.....	.....	151	66,791	285	82,332	.....	.....	18

MATERIALS USED.

Total cost.	Domestic iron ore.		Foreign iron ore.		Fluxing material.		Anthracite coal.		Bituminous coal.		Coke.		
	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	
$110,098,615	15,734,400	$57,607,945	1,090,712	$5,897,585	5,624,290	$4,196,878	2,012,477	$5,165,761	551,007	$759,522	9,237,935	$27,435,780	1
6,493,884	2,043,846	2,198,335	65	406	546,655	343,752	.....	.....	29,968	50,475	1,172,471	3,033,258	2
412,743	47,635	182,261	.....	.....	7,300	4,740	.....	.....	.....	.....	.....	.....	3
237,836	65,563	94,989	.....	.....	11,895	5,632	.....	.....	4,000	8,000	41,102	88,987	4
8,088,153	1,071,119	4,802,854	4,328	37,372	218,768	195,592	.....	.....	3,590	6,303	645,287	2,760,009	5
461,608	71,016	147,045	.....	.....	37,308	28,793	.....	.....	91,313	125,738	13,647	37,444	6
1,316,539	46,271	115,605	136,704	663,016	58,311	54,523	.....	.....	1,319	3,404	95,821	343,024	7
2,935,233	392,522	1,451,212	.....	.....	19,096	23,235	.....	.....	56	200	.....	.....	8
1,247,688	178,203	535,965	.....	.....	54,047	33,502	45	141	3,308	4,988	97,992	486,807	9
1,679,937	227,292	838,604	15,288	86,014	94,164	60,573	173,067	486,155	.....	.....	37,856	155,131	10
4,212,888	609,010	1,982,252	12,598	50,811	201,741	178,079	185,348	692,560	50	170	241,824	1,114,536	11
15,696,665	2,051,833	9,385,714	.....	.....	674,281	521,914	.....	.....	303,772	367,759	1,440,483	4,435,255	12
57,222,481	6,861,218	30,837,951	914,549	5,034,786	3,114,338	2,321,804	1,654,017	3,986,905	50,935	79,235	4,409,294	11,938,860	13
2,450,882	676,004	1,110,533	.....	.....	133,477	81,661	.....	.....	8,643	11,025	388,588	922,327	14
2,820,167	698,509	1,325,593	.....	.....	308,007	190,328	.....	.....	12,104	23,208	368,881	1,104,415	15
1,503,847	207,567	1,025,257	.....	.....	54,053	52,503	.....	.....	1,476	1,476	147,008	403,506	16
2,378,006	354,404	1,226,444	.....	.....	54,317	46,011	.....	.....	1,451	3,597	116,024	525,385	17
940,058	132,388	347,431	7,180	25,180	36,532	54,236	.....	.....	39,022	73,944	21,657	86,836	18

e Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 1; Indiana, 2; Maine, 1; Massachusetts, 1; North Carolina, 1; Oregon, 1; Texas, 1; Washington, 1.

TABLE 1.—DETAILED STATEMENT, BLAST

	STATES.	MATERIALS USED—continued.						PRODUCTS.						
		Charcoal.		Mill cinder and scrap.		Rent of power and heat.	All other materials.	Aggregate value.	Pig iron.					
									Total. (a)		Cold blast charcoal.		Hot or warm blast charcoal.	
		Bushels.	Cost.	Tons.	Cost.	Cost.	Cost.		Tons.	Value.	Tons.	Value.	Tons.	Value.
1	The United States	67,672,156	$4,523,320	1,283,071	$3,086,808	$8,900	$1,416,116	$145,643,153	9,906,607	$145,612,983	36,846	$714,591	627,865	$11,243,119
2	Alabama	12,580,690	809,028	16,573	15,260	.....	43,370	10,315,691	915,689	10,315,691	20,426	340,378	88,563	1,564,709
3	Connecticut	2,263,386	225,288	45	454	.....	.....	574,438	22,255	574,438	.....	.....	22,255	574,438
4	Georgia	666,924	39,540	.....	.....	.....	688	839,422	28,111	339,422	.....	.....	5,039	96,598
5	Illinois	.....	.....	42,826	194,568	.....	91,455	10,138,310	746,677	10,136,960	.....	.....	.....	.....
6	Kentucky	921,264	40,919	30,467	81,669	.....	.....	665,763	44,278	665,763	.....	.....	6,060	109,856
7	Maryland	1,535,460	114,653	.....	.....	.....	22,314	1,632,004	96,636	1,632,004	.....	.....	14,450	333,603
8	Michigan	19,851,038	1,441,489	22	59	3,000	16,038	3,982,278	227,827	3,982,278	.....	.....	227,827	3,982,278
9	Missouri	3,088,122	175,343	.....	.....	.....	11,042	1,716,983	101,030	1,716,983	.....	.....	33,742	525,481
10	New Jersey	.....	.....	38,362	44,368	.....	9,092	2,228,724	145,040	2,228,724	.....	.....	.....	.....
11	New York	2,259,504	146,069	16,552	27,335	.....	21,076	5,182,606	344,339	5,182,606	.....	.....	15,949	332,063
12	Ohio	3,326,657	172,899	271,198	721,768	.....	91,356	19,800,268	1,347,519	19,800,203	4,149	91,100	18,376	353,941
13	Pennsylvania	2,470,225	171,225	811,939	1,907,690	5,900	938,126	75,239,203	4,867,504	75,212,758	4,355	113,283	13,023	288,165
14	Tennessee	5,152,180	259,028	15,331	24,394	.....	41,914	3,366,464	295,889	3,366,464	.....	.....	51,349	663,916
15	Virginia	1,082,817	72,060	6,700	10,572	.....	93,991	3,925,481	312,367	3,925,481	7,916	169,830	.....	.....
16	West Virginia	.....	.....	10,541	20,545	.....	560	2,009,505	129,369	2,009,505	.....	.....	.....	.....
17	Wisconsin	7,256,017	524,728	13,719	24,101	.....	27,740	3,114,892	215,143	3,114,892	.....	.....	94,204	1,494,775
18	All other states	5,217,872	331,051	8,796	14,025	.....	7,355	1,411,121	67,014	1,408,811	.....	.....	37,028	903,296

a Includes 6,066 tons of castings made direct from furnace, also 133,704 tons of spiegeleisen, valued at $3,525,042, distributed as follows: Colorado, 752 tons, $18,168; Illinois, 21,635 tons, $621,956; New Jersey, 11,555 tons, $291,481; Pennsylvania, 99,762 tons, $2,593,437.

CAPITAL, EQUIPMENT, AND DAILY CAPACITY

	STATES.	Number of establishments.	CAPITAL.			
			Total.	Land.	Buildings, machinery, tools, and implements.	Live assets. (a)
1	The United States	73	$6,458,865	$1,164,839	$4,695,150	$598,876
2	Alabama	1	120,000	20,000	100,000	.....
3	Connecticut	2	128,300	10,300	68,000	50,000
4	Georgia	1	43,000	10,000	30,000	3,000
5	Illinois	1	70,000	15,000	55,000	.....
6	Kentucky	2	240,000	24,000	166,000	50,000
7	Maryland	2	325,000	35,000	215,000	75,000
8	Massachusetts	1	63,000	3,000	60,000	.....
9	Minnesota	1	370,000	100,000	250,000	20,000
10	Michigan	6	373,700	38,200	335,500	.....
11	Missouri	1	15,300	800	14,500	.....
12	New Jersey	5	453,500	41,000	412,500	.....
13	New York	8	1,005,755	209,654	619,850	176,251
14	Ohio	10	1,687,885	443,000	1,230,385	14,500
15	Pennsylvania	18	975,625	136,885	698,615	140,125
16	Tennessee	2	31,500	4,500	27,000	.....
17	Texas	2	270,000	20,000	200,000	50,000
18	Virginia	8	249,800	47,000	182,800	20,000
19	West Virginia	1	30,000	5,000	25,000	.....
20	Wisconsin	1	6,500	1,500	5,000	.....

a Includes raw material, stock in process and finished products on hand, and cash, bills and accounts receivable, and sundry items of capital not elsewhere reported.

FURNACES, BY STATES: 1890—Continued.

PRODUCTS—continued.							EQUIPMENT AND CAPACITY.								
Pig iron—Continued.									Power.						
Anthracite.		Mixed anthracite coal and coke.		Coke and bituminous coal.		Value of all other products.	Completed blast furnace stacks.		Steam.			Water.			
Tons	Value.	Tons.	Value.	Tons.	Value.		Number.	Total daily capacity in tons of pig iron.	Number of boilers.	Number of engines.	Horse power.	Number of water wheels.	Horse power.	Number of turbine wheels.	Horse power.
330,886	$4,772,021	1,893,241	$28,195,996	7,017,769	$100,687,256	$30,170	473	39,411	3,581	966	246,997	19	778	17	1,153
				806,620	8,390,604		47	4,162	466	105	40,290				
				23,072	242,824		7	103	2	1	60	4	155	2	110
				746,677	10,136,960	1,350	4	245	32	7	2,110				
				38,218	555,907		14	2,722	152	29	8,778				
							4	173	26	12	2,380				
				82,186	1,298,401		10	628	39	20	2,810				
							19	924	80	56	3,880			3	200
				67,288	1,191,502		7	530	47	23	3,123				
29,452	542,039	116,588	1,686,685				12	686	97	17	6,710				
35,922	531,694	175,839	2,529,901	116,029	1,788,948		26	1,689	158	34	13,085	2	160	2	150
				1,324,994	19,355,162	65	59	5,098	457	147	26,526				
265,512	3,698,288	1,601,814	23,979,410	2,982,800	47,133,612	26,445	202	18,511	1,632	404	113,104	6	375	2	78
				244,540	2,702,548		17	1,094	128	31	6,306				
				304,451	3,755,651		23	1,124	131	31	7,990	3	25	8	615
				129,369	2,009,505		4	495	34	11	2,810				
				120,939	1,620,117		9	812	59	19	2,855				
				29,986	505,515	2,310	9	415	41	19	4,180	4	63		

AND POWER OF IDLE BLAST FURNACES: 1890.

COMPLETED BLAST FURNACE STACKS.		STEAM POWER.			WATER POWER.			
Number.	Total daily capacity in tons of pig iron.	Number of boilers.	Number of engines.	Horse power.	Water wheels.	Horse power.	Turbine wheels.	Horse power.
86	3,025	333	120	19,109	9	505	2	90
1	75	8	1	260				
2	26				2	75		
1	14	2	1	100				
1	50	8	3	350				
2	150	12	9	900				
4	85	10	5	800			1	50
4	55	2	1	40				
1	150	8	3	1,050				
7	292	21	7	650				
1	20	3	1	125				
6	240	22	8	2,150	2	250		
11	420	21	9	1,930				
12	615	71	29	5,500				
19	582	119	24	4,219	2	90	1	40
2	15	3	1	125	1	30		
2	100	6	7	280				
8	76	13	7	365	2	60		
1	30	2	2	125				
1	30	2	2	200				

TABLE 2.—DETAILED STATEMENT, ROLLING

	STATES.	Number of establishments.	CAPITAL. Direct investment. Value of hired property.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Live assets. (a)	Miscellaneous expenses. (b)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. Aggregates. Average number.	Total wages.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Number.	Wages.
1	The United States.	395	$3,212,000	$275,347,831	$24,354,079	$30,496,512	$95,700,648	$124,796,592	$11,817,593	140,537	$79,293,673	890	$2,630,536
2	Alabama	7	.....	2,208,797	330,473	358,503	1,024,754	495,067	157,463	1,739	738,308	21	39,343
3	California	4	.....	4,656,611	432,000	375,000	1,764,000	2,085,611	208,088	1,152	749,849	12	34,509
4	Connecticut	8	.....	1,249,429	239,397	136,070	367,735	506,227	56,627	561	351,308	17	28,850
5	Delaware	7	.....	2,558,865	283,500	263,000	706,136	1,306,229	43,201	1,696	843,219	25	61,400
6	Illinois	19	271,000	24,563,645	1,861,254	2,995,339	8,661,568	11,045,484	577,876	7,433	4,571,046	38	125,515
7	Indiana	13	950,000	2,938,254	196,432	270,615	1,297,888	1,173,319	169,435	2,644	1,215,792	28	62,173
8	Kentucky	5	.....	1,484,456	180,000	140,000	605,000	559,456	65,990	1,205	628,658	13	31,000
9	Maryland	4	500,000	571,352	110,000	75,000	269,852	116,500	20,747	573	211,009	6	10,250
10	Massachusetts	14	115,000	8,229,394	586,665	788,726	2,120,099	4,733,904	169,937	5,290	2,629,699	20	55,800
11	Michigan	4	.....	1,437,540	103,650	159,465	543,582	630,843	98,096	777	479,783	10	30,064
12	Missouri	4	.....	1,612,443	523,793	157,269	510,181	421,200	102,786	660	421,935	7	15,300
13	New Jersey	19	150,000	8,375,996	817,417	864,252	2,673,999	4,020,328	594,967	4,627	2,514,404	43	131,650
14	New York	19	.....	9,321,793	833,000	1,143,436	2,313,994	5,031,363	486,805	5,418	2,872,316	32	102,000
15	Ohio	55	398,000	25,494,390	2,005,678	2,877,717	9,278,704	11,332,291	1,552,785	19,942	12,069,542	131	351,002
16	Pennsylvania	186	828,000	165,863,801	14,740,191	17,942,979	58,194,521	74,986,110	7,072,834	78,347	44,921,173	405	1,336,906
17	Tennessee	4	.....	927,549	143,000	143,000	405,555	235,994	91,295	481	249,529	9	21,000
18	Virginia	6	.....	2,174,787	410,750	281,000	646,852	836,185	100,471	1,782	705,048	17	49,595
19	West Virginia	8	.....	5,012,842	285,000	820,091	1,629,683	2,278,068	88,289	3,409	1,639,276	34	60,563
20	All other states (c)	9	.....	6,665,887	271,879	705,050	2,086,545	3,002,413	249,901	2,807	1,481,779	22	83,616

	STATES.	WEEKLY RATES OF WAGES PAID, AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, EXCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS. Aggregates. Average number.	Total wages.	Males above 16 years. Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.
1	The United States.	137,295	$74,460,433	135,134	1,402	3,144	8,000	15,333	19,370	17,340	17,827	19,634	16,173	9,961	6,950
2	Alabama	1,696	681,660	1,676	2	25	97	294	155	158	227	220	286	162	50
3	California	1,114	693,300	1,089	10	47	18	9	21	177	367	108	142	124	66
4	Connecticut	532	311,771	530	2	1	6	22	90	131	87	83	49	38	21
5	Delaware	1,637	765,158	1,562	.....	30	103	388	255	114	178	268	154	47	25
6	Illinois	7,265	4,324,853	7,203	7	33	88	379	1,332	953	1,064	890	831	1,042	584
7	Indiana	2,581	1,120,779	2,517	51	35	40	300	213	449	232	393	315	280	209
8	Kentucky	1,173	582,007	1,092	5	5	70	148	116	113	145	139	214	76	61
9	Maryland	557	194,181	557	.....	16	25	76	88	65	71	64	114	22	16
10	Massachusetts	5,168	2,454,035	5,126	34	146	325	562	1,135	1,033	719	580	385	127	80
11	Michigan	752	435,339	752	19	17	64	187	57	103	83	72	45	68	37
12	Missouri	642	393,896	641	20	6	22	15	29	144	119	97	88	53	48
13	New Jersey	4,493	2,301,592	4,468	62	92	416	384	511	648	794	739	550	163	109
14	New York	5,291	2,672,454	5,227	55	139	253	641	537	756	762	709	737	369	209
15	Ohio	19,489	11,405,904	19,179	243	371	628	2,679	2,233	1,938	2,231	3,480	2,187	1,778	1,411
16	Pennsylvania	76,609	42,356,589	75,599	733	1,744	5,192	8,634	11,642	9,494	9,554	10,709	9,101	5,038	3,668
17	Tennessee	460	218,699	453	.....	.....	70	34	84	50	34	40	102	23	16
18	Virginia	1,742	639,347	1,687	65	253	377	215	133	204	154	163	80	29	14
19	West Virginia	3,346	1,552,589	3,196	84	182	173	182	512	403	422	289	432	328	189
20	All other states	2,743	1,356,280	2,580	10	2	33	184	227	407	584	441	361	194	137

a Includes raw materials, stock in process and finished products on hand, and cash, bills and accounts receivable, and sundry items of capital not elsewhere reported.

b Includes rent, taxes, insurance, interest paid on cash used in the business, and all sundries not elsewhere reported.

MILLS AND STEEL WORKS, BY STATES: 1890.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.

Clerks.				Operatives and skilled.						Unskilled.						
Males above 16 years.		Females above 15 years.		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.		
Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
2,303	$2,176,004	49	$26,700	77,503	$52,546,013	2	$1,040	133	$36,550	57,631	$21,495,266	56	$16,066	1,970	$365,498	1
22	17,305	.....	.....	1,022	535,037	.....	.....	.....	.....	654	144,295	.....	.....	20	2,328	2
26	22,040	.....	.....	434	377,744	.....	.....	.....	.....	655	309,706	.....	.....	25	5,850	3
12	10,687	.....	.....	300	215,035	.....	.....	.....	.....	230	96,356	.....	.....	2	380	4
26	15,831	2	830	1,075	582,108	.....	.....	.....	.....	487	169,250	.....	.....	75	13,800	5
128	119,108	2	1,570	4,250	3,159,542	.....	.....	.....	.....	2,953	1,154,955	.....	.....	62	10,356	6
32	31,320	3	1,520	1,555	830,845	.....	.....	.....	.....	962	280,284	.....	.....	64	9,650	7
19	15,651	.....	.....	721	443,812	.....	.....	.....	.....	371	125,705	.....	.....	81	12,490	8
10	6,578	.....	.....	435	167,033	.....	.....	.....	.....	122	27,148	.....	.....	.....	.....	9
102	119,864	.....	.....	2,788	1,482,070	.....	.....	.....	.....	2,338	959,273	42	12,692	.....	.....	10
15	14,380	.....	.....	423	311,905	.....	.....	.....	.....	329	123,434	.....	.....	.....	.....	11
11	12,739	.....	.....	370	282,768	.....	.....	.....	.....	271	110,978	.....	.....	1	150	12
84	80,122	2	1,040	2,698	1,655,200	.....	.....	.....	.....	1,770	641,208	1	150	29	5,034	13
92	96,302	3	1,560	2,763	1,744,743	.....	.....	.....	.....	2,464	914,619	.....	.....	64	13,092	14
315	308,778	7	3,858	11,549	8,439,198	2	1,040	75	22,550	7,630	2,8-9,348	12	2,808	221	50,959	15
1,305	1,212,396	28	15,282	43,133	29,927,538	.....	.....	.....	.....	32,466	12,239,056	1	416	1,009	189,579	16
12	9,830	.....	.....	215	138,466	.....	.....	.....	.....	238	78,783	.....	.....	7	1,450	17
23	16,106	.....	.....	760	384,367	.....	.....	.....	.....	927	248,280	.....	.....	55	6,700	18
28	25,604	1	520	1,764	1,081,102	.....	.....	.....	.....	1,432	449,634	.....	.....	150	21,853	19
41	41,363	1	520	1,248	787,499	.....	.....	58	14,000	1,332	532,954	.....	.....	105	21,827	20

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, EXCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS—continued.

Females above 15 years.								Children.						MATERIALS USED.			
															Iron ore.		
Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	Total cost.	Tons.	Cost.	
58	28	12	8	4	3	1	2	2,103	1,484	319	282	16	2	$216,269,022	581,503	$3,355,139	1
.....	.....	.....	.....	.....	.....	.....	.....	20	14	6	.....	.....	.....	931,460	12,046	95,917	2
.....	.....	.....	.....	.....	.....	.....	.....	25	25	.....	.....	.....	.....	1,938,333	339	2,712	3
.....	.....	.....	.....	.....	.....	.....	.....	2	2	.....	.....	.....	.....	911,335	402	2,051	4
.....	.....	.....	.....	.....	.....	.....	.....	75	75	.....	.....	.....	.....	1,549,539	6,827	37,362	5
.....	.....	.....	.....	.....	.....	.....	.....	62	36	26	.....	.....	.....	21,951,521	4,448	25,395	6
.....	.....	.....	.....	.....	.....	.....	.....	64	34	15	15	.....	.....	2,889,615	12,153	72,915	7
.....	.....	.....	.....	.....	.....	.....	.....	81	51	20	10	.....	.....	1,241,536	8,782	23,344	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	766,849	437	2,975	9
42	15	12	8	4	3	.....	.....	.....	.....	.....	.....	.....	.....	6,786,610	1,590	10,214	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,200,758	1,180	5,018	11
.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	831,566	423	2,546	12
1	1	.....	.....	.....	.....	.....	.....	29	29	.....	.....	.....	.....	5,326,401	26,257	145,920	13
.....	.....	.....	.....	.....	.....	.....	.....	64	51	13	.....	.....	.....	5,932,461	28,057	103,768	14
14	12	.....	.....	.....	.....	.....	2	296	85	5	196	10	.....	23,854,636	99,892	566,543	15
1	.....	.....	.....	.....	.....	1	.....	1,009	858	110	33	6	2	122,530,544	359,762	2,126,540	16
.....	.....	.....	.....	.....	.....	.....	.....	7	5	2	.....	.....	.....	492,789	3,099	9,040	17
.....	.....	.....	.....	.....	.....	.....	.....	55	55	.....	.....	.....	.....	1,584,285	3,116	19,670	18
.....	.....	.....	.....	.....	.....	.....	.....	150	73	77	.....	.....	.....	6,402,189	8,382	52,860	19
.....	.....	.....	.....	.....	.....	.....	.....	163	90	45	28	.....	.....	4,146,595	9,311	49,749	20

c Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Colorado, 1; Georgia, 1; Iowa, 1; Maine, 1; Minnesota, 1; New Hampshire, 1; Rhode Island, 1; Wisconsin, 1; Wyoming, 1.

TABLE 2.—DETAILED STATEMENT, ROLLING MILLS

	STATES.	MATERIALS USED—continued.									
		Spiegeleisen and ferro-manganese.		Pig iron.		Old iron rails.		Other old or scrap iron.		Old steel rails and steel rail ends.	
		Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost
1	The United States.	248,536	$7,588,784	6,299,999	$97,758,067	392,495	$9,109,765	943,623	$16,418,611	145,837	$2,627,649
2	Alabama	2	170	48,303	478,084	1,468	35,275	5,784	90,277		
3	California	25	2,000	1,120	29,000	11,985	296,211	35,051	843,690	2,138	42,840
4	Connecticut			125	2,980	924	20,790	21,226	289,620		
5	Delaware			25,350	393,397	14,500	357,500	22,479	405,702		
6	Illinois	56,954	1,651,097	816,953	12,742,004	99,856	2,319,994	68,287	1,151,644	8,419	177,018
7	Indiana	80	5,600	42,622	635,797	4,125	98,700	43,304	746,848	5,337	125,039
8	Kentucky			17,069	241,761	1,792	36,800	21,036	392,413		
9	Maryland			6,417	95,400			3,456	58,500		
10	Massachusetts	573	41,261	16,461	336,738	10,946	275,656	32,403	487,121	2,268	43,092
11	Michigan	32	2,600	10,751	174,088	21,826	488,974	14,265	245,617		
12	Missouri			1,852	30,272	1,784	37,464	26,320	474,415		
13	New Jersey	452	27,232	74,759	1,027,545	5,641	129,415	19,949	369,825		
14	New York	2,242	102,796	205,512	3,126,865	1,331	26,089	31,903	645,016	7,300	168,500
15	Ohio	6,208	399,707	873,711	13,057,207	92,712	2,080,646	147,835	2,311,702	12,875	245,745
16	Pennsylvania	179,209	5,235,978	3,840,584	60,348,110	57,848	1,377,132	388,510	6,772,770	107,100	1,817,815
17	Tennessee			12,638	152,826	9,189	203,338	549	8,211		
18	Virginia			23,296	305,377	29,822	723,244	8,900	166,541		
19	West Virginia	1,707	92,927	226,847	3,678,599			2,339	48,836		
20	All other states	1,052	27,416	55,629	902,017	26,746	602,537	50,027	909,863	400	7,600

	STATES.	MATERIALS USED—continued.												
		Fuel.										Rent of power and heat.	All other materials.	
		Anthracite coal and culm.		Bituminous coal and slack.		Coke.		Charcoal.		Oil.		Natural gas.		
		Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Bushels.	Cost.	Barrels.	Cost.	Cost.	Cost.	Cost.
1	The United States.	961,039	$1,487,713	5,171,102	$9,663,208	393,050	$1,311,588	2,770,611	$243,773	1,859,138	$1,124,206	$3,566,946	$20,910	$16,712,412
2	Alabama			117,834	141,788									59,761
3	California			52,551	361,419	10	110							137,353
4	Connecticut	7,906	34,452	26,728	93,512	228	1,415	48,450	4,362					44,980
5	Delaware	6,975	27,644	74,233	202,347			87,335	8,394					33,623
6	Illinois			408,966	539,841	78,469	332,802	4,770	251	637,197	385,992			958,006
7	Indiana			130,026	183,503	345	2,105			20,000	12,000	(a)		29,101
8	Kentucky	672	3,600	104,204	133,915			26,707	2,144					18,505
9	Maryland	647	2,337	34,258	85,538									38,457
10	Massachusetts	8,848	46,837	133,205	551,772	5,122	34,156	870,853	71,927	2,160	3,510			2,042,419
11	Michigan			27,932	63,756	1,700	7,911	24,496	1,842	84,952	52,064			75,151
12	Missouri			54,850	104,960	2,205	12,019	69,500	6,950	3,090	3,585			56,155
13	New Jersey	92,869	228,190	173,216	524,219	3,455	16,876	10,950	1,737	7,421	8,024			1,254,045
14	New York	16,700	66,756	228,839	572,806	12,103	48,507	3,426	848	5,465	9,564			349,812
15	Ohio			1,459,482	1,764,378	65,356	214,168	113,040	9,422	920,926	489,248	151,403		1,121,472
16	Pennsylvania	825,947	1,075,764	1,727,493	3,555,484	200,769	571,060	1,510,984	135,883	177,927	160,219	3,391,468	2,000	9,059,831
17	Tennessee			62,750	91,814									22,810
18	Virginia	400	1,720	50,137	112,326								16,510	81,463
19	West Virginia			171,774	167,920	20,725	58,981	100	13			24,075		884,298
20	All other states	75	413	132,694	411,910	2,563	11,478						2,400	445,170

a Natural gas in Indiana supplied free.

AND STEEL WORKS, BY STATES: 1890—Continued.

MATERIALS USED—continued.

Other old or scrap steel.		Hammered iron ore blooms.		Hammered pig or scrap blooms.		Purchased muck bar.		Purchased bessemer steel.		Purchased open-hearth steel.		Swedish billets and bars		
Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons	Cost.	Tons.	Cost.	Tons	Cost.	
451,346	$7,945,013	16,936	$599,983	23,452	$720,457	234,678	$6,252,594	838,118	$24,117,921	141,342	$4,635,585	15,463	$1,008,698	1
										1,435	30,188			2
3,873	78,115							3,750	130,210	434	14,673			3
1,482	33,579	110	4,680					7,731	256,712	2,500	100,482	340	21,120	4
		103	3,850			2,256	61,534	250	6,600	361	11,586			5
103,455	1,520,297					400	11,600	5,226	134,156	36	1,424			6
168	2,560			2,000	56,000			31,743	917,527	60	1,920			7
								12,634	379,921	268	9,133			8
1,400	28,000	100	5,000			1,308	50,959	5,447	162,212	6,806	221,471	200	16,000	9
18,063	299,152							74,553	2,190,070	8,325	264,725	1,256	87,960	10
2,289	39,002							44	1,315	913	34,000	114	9,420	11
								3,220	103,200					12
16,702	347,101	336	19,520			1,844	49,436	22,017	694,073	11,593	384,317	1,248	98,926	13
8,221	149,543	699	27,903			3,940	109,611	3,516	94,846	5,211	192,800	2,024	136,431	14
52,853	948,921	1,051	32,490	42	1,038	13,100	328,494	178,857	5,084,452	1,146	47,600			15
240,600	4,460,777	14,477	504,020	21,410	663,419	209,313	5,572,617	404,875	11,739,550	102,254	3,321,266	10,281	638,841	16
200	4,750													17
						2,508	68,100	2,964	89,334					18
888	12,837							52,332	1,380,843					19
1,152	20,379	60	2,520			9	243	28,950	752,900					20

PRODUCTS.

Summary of classified products.

Aggregate value.	Total.		Iron.		Bessemer steel.		Open-hearth steel.		Crucible and miscellaneous steel.		
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	
$331,860,872	8,274,833	$325,613,449	3,225,140	$132,620,665	4,385,365	$150,655,612	590,198	$32,934,121	74,130	$9,403,051	1
2,228,536	52,205	2,194,651	50,550	2,132,721			1,655	61,930			2
3,097,155	56,747	3,052,485	39,303	1,950,181	7,513	436,059	9,931	666,245			3
1,463,180	27,727	1,462,140	17,123	757,741	6,695	313,750	2,340	143,835	1,569	246,814	4
2,608,670	58,437	2,553,942	57,913	2,520,809	380	24,500	144	8,633			5
28,872,741	910,648	28,678,000	156,404	6,400,731	751,784	21,860,141	2,015	341,937	445	75,191	6
4,505,536	110,201	4,448,299	73,731	2,891,801	35,170	1,471,313	1,050	27,500	250	57,685	7
2,059,840	49,082	2,040,101	36,711	1,486,099	12,098	536,874	273	17,128			8
1,062,204	20,222	1,038,467	8,479	452,469	6,865	294,985	3,878	188,513	1,000	102,500	9
10,981,649	150,621	8,812,278	42,224	1,873,163	87,051	5,465,176	20,102	1,250,579	1,184	223,360	10
1,847,565	40,588	1,826,809	33,478	1,296,809	4,250	320,746	400	32,000	2,460	177,254	11
1,520,559	27,708	1,509,223	25,208	1,334,223	2,500	175,000					12
8,756,431	157,276	8,658,788	89,818	4,334,003	30,689	1,836,992	29,425	1,675,800	7,344	811,993	13
10,310,088	240,026	10,241,488	109,472	5,339,587	118,346	3,466,407	4,880	372,770	7,328	1,062,724	14
45,406,560	1,128,013	45,082,191	571,334	21,951,752	502,860	19,804,838	53,819	3,325,601			15
188,714,190	4,770,976	185,742,795	1,705,202	69,069,307	2,556,328	85,439,308	457,026	24,601,650	52,420	6,632,530	16
881,404	20,651	854,958	20,821	841,958					130	13,000	17
2,400,603	52,442	2,367,103	50,655	2,283,091	1,787	84,012					18
8,547,360	259,838	8,493,356	39,223	1,172,790	220,615	7,320,566					19
6,596,601	141,425	6,556,375	97,791	4,531,430	40,434	1,804,945	3,200	220,000			20

TABLE 2.—DETAILED STATEMENT, ROLLING MILLS

	STATES.	PRODUCTS—continued.									
		Rails.				Bars and rods, except wire rods.					
		Iron.		Bessemer steel.		Iron.		Bessemer steel.		Open-hearth steel.	
		Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
1	The United States	15,361	$622,224	2,076,325	$60,272,575	1,304,115	$50,048,590	340,257	$12,864,136	116,657	$5,654,689
2	Alabama	2,087	80,653			33,565	1,241,508			226	6,945
3	California	3	165	4,839	261,306	23,452	1,086,048			6,517	347,255
4	Connecticut					14,181	609,856	655	35,750	1,510	78,750
5	Delaware					18,500	661,930				
6	Illinois	3,069	122,760	614,837	16,933,031	96,327	3,394,382	36,977	1,027,705		
7	Indiana	760	30,000	600	24,000	47,580	1,753,664	35	1,400		
8	Kentucky					19,953	780,042				
9	Maryland					1,700	67,500	5,265	214,985	2,278	93,513
10	Massachusetts					20,426	748,496	415	20,750	5,825	291,250
11	Michigan					23,606	838,800				
12	Missouri					3,922	151,389				
13	New Jersey					18,283	764,776	6,682	329,060	12,950	822,100
14	New York					83,770	4,094,596	12,521	597,929	3,580	177,970
15	Ohio	2,063	97,268	2,990	106,390	376,415	13,524,341	8,126	321,490	14,032	639,105
16	Pennsylvania	2,571	95,590	1,436,265	42,321,749	435,654	16,979,948	262,611	10,036,267	69,739	3,197,801
17	Tennessee	2,227	87,428			11,748	452,646				
18	Virginia					13,883	548,485				
19	West Virginia			536	20,000						
20	All other states	2,581	108,360	16,258	606,099	61,150	2,350,183	6,970	278,800		

	STATES.	PRODUCTS—continued.									
		Sheet.						Boiler plate.			
		Iron.		Bessemer steel.		Open-hearth steel.		Iron.		Bessemer steel.		Open-hearth steel.	
		Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
1	The United States	154,521	$9,693,064	61,332	$4,037,226	31,389	$2,437,680	66,461	$3,158,319	9,065	$396,809	89,720	$5,019,001
2	Alabama	4,550	297,161			31	1,805						
3	California												
4	Connecticut												
5	Delaware	7,075	434,378	200	11,000	126	7,375	713	42,795			18	1,258
6	Illinois												
7	Indiana												
8	Kentucky	2,323	135,480					870	48,422	551	31,880	263	16,532
9	Maryland	3,979	250,969					400	26,000	1,600	80,000	1,600	95,000
10	Massachusetts									1,373	66,240		
11	Michigan							3,701	171,998				
12	Missouri	3,675	349,125	2,500	175,000								
13	New Jersey	2,249	150,000										
14	New York												
15	Ohio	46,499	2,665,598	18,769	1,149,347	2,260	202,140	11,806	586,797			16,012	1,141,472
16	Pennsylvania	77,864	5,040,494	24,704	2,401,122	28,972	2,226,360	48,971	2,332,307	5,541	218,689	71,827	3,764,739
17	Tennessee												
18	Virginia												
19	West Virginia	6,307	369,859	5,159	300,757								
20	All other states												

AND STEEL WORKS, BY STATES: 1890—Continued.

PRODUCTS—continued.

Hoop.						Skelp.				Structural shapes.						
Iron.		Bessemer steel.		Open-hearth steel.		Iron.		Bessemer steel.		Iron.		Bessemer steel.		Open-hearth steel.		
Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	
123,317	$5,076,591	5,429	$234,706	3,532	$160,000	465,550	$17,621,186	13,919	$536,366	137,527	$6,941,474	95,693	$4,529,411	76,298	$3,992,074	1
291	12,804															2
										2,650	132,500			2,236	134,160	3
																4
						5,954	242,581									5
																6
										1,320	60,000			50	2,500	7
										2,000	85,000					8
																9
																10
																11
																12
										20,832	1,146,112	840	49,491	10,000	500,000	13
100	5,600					9,520	361,760			2,528	108,217					14
27,778	1,134,750	2,789	122,903			28,377	1,088,648					4,937	217,228			15
95,148	3,923,437	2,640	111,803	3,532	160,000	421,699	15,928,197	9,630	390,183	107,597	5,385,645	89,916	4,262,692	64,012	3,355,414	16
																17
																18
								4,289	146,183							19
										600	24,000					20

PRODUCTS—continued.

All other plate, except mail plate.						Rolled car axles.				Hammered car axles.						Muck bar for sale.		
Iron.		Bessemer steel.		Open-hearth steel.		Iron.		Open-hearth steel.		Iron.		Bessemer steel.		Open-hearth steel.				
Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	
139,549	$5,973,520	91,840	$4,056,021	87,139	$4,587,454	1,500	$67,500	1,000	$60,000	36,545	$1,685,345	11,456	$609,677	10,445	$640,429	282,340	$7,411,748	1
4,991	239,330			1,098	45,080					4,303	215,150							2
										1,489	60,912							3
		6,000	276,000															4
1,501	66,055									5,000	225,000					500	15,000	5
																606	17,180	6
										5,626	298,197					7,175	166,200	7
5,707	258,459	1,729	92,659	10	596											5,258	137,696	8
2,400	108,000																	9
		4,882	192,240															10
										5,097	229,399							11
										7,385	313,386							12
1,911	91,728	1,287	52,992	5,300	264,400											11,727	311,175	13
5,286	228,864	1,211	47,094							285	14,229	20	995					14
5,199	233,595	15,895	820,178	3,134	208,925					2,489	118,551	8,836	493,282	1,886	178,534	34,631	985,293	15
112,554	4,747,489	49,487	2,240,473	74,897	3,900,453	1,500	67,500	1,000	60,000	3,274	143,489	2,600	115,400	8,559	461,895	189,619	4,980,246	16
																		17
										1,597	67,032							18
		11,349	334,385													32,824	798,958	19
				2,700	168,000													20

TABLE 2.—DETAILED STATEMENT, ROLLING MILLS

	STATES.	PRODUCTS—continued.												
		Cut nails.						All other classified products.						Value of all other products, including amounts received for custom work and repairing.
		Iron.		Bessemer steel.		Open-hearth steel.		Iron.		Bessemer steel.		Open-hearth steel.		
		Kegs of 100 pounds.	Value.	Kegs of 100 pounds.	Value.	Kegs of 100 pounds.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	
1	The United States.	2,139,086	$4,577,557	3,704,604	$7,676,306	13,340	$79,740	391,400	$19,743,547	1,494,819	$55,442,379	173,351	$10,303,054	$6,247,423
2	Alabama							763	46,115			300	8,100	33,885
3	California	222,188	641,000	24,831	74,211	9,340	42,630	600	29,556	1,432	100,542	711	142,200	44,670
4	Connecticut							2,942	147,885	40	2,000	830	65,085	1,040
5	Delaware							18,670	833,070	180	13,500			54,728
6	Illinois			192,985	394,743			56,402	2,866,409	90,321	3,504,662	2,015	341,937	194,741
7	Indiana	25,000	50,000	214,832	454,509			10,020	533,740	23,793	991,404	1,000	25,000	57,237
8	Kentucky			196,350	412,335			600	41,050					19,739
9	Maryland													23,737
10	Massachusetts	116,840	260,624	100,719	227,084			15,956	864,043	75,345	4,958,862	14,337	959,329	2,169,371
11	Michigan							1,074	56,612	4,250	320,746	400	32,000	20,756
12	Missouri							10,226	520,323					11,336
13	New Jersey	286,115	556,757	1,245	3,893			20,510	1,313,455	21,818	1,401,556	1,175	89,300	97,643
14	New York							7,983	526,321	104,594	2,820,389	1,300	194,800	68,600
15	Ohio	68,054	140,613	1,351,251	2,775,440			32,674	1,426,298	372,956	13,798,580	16,495	955,425	324,369
16	Pennsylvania	1,233,430	2,484,672	639,894	1,265,733	4,000	37,110	147,080	6,960,293	630,939	22,075,197	134,288	7,437,878	2,971,395
17	Tennessee							6,546	301,884					26,446
18	Virginia	182,493	433,593	35,750	84,012			26,050	1,233,981					33,500
19	West Virginia	1,848	3,973	945,982	1,982,788					151,983	4,536,453			54,004
20	All other states	3,118	6,325	765	1,558			33,304	2,042,562	17,168	918,488	500	52,000	40,226

a Two bessemer converters were reported from Virginia, for which the capacity was not given.

CAPITAL, EQUIPMENT, AND DAILY CAPACITY AND

	STATES.	No. of establishments.	CAPITAL.					Number of single puddling furnaces.	Number of heating furnaces.	Number of hammers.	Number of cut nail machines.
			Total.	Land.	Buildings.	Machinery, tools, and implements.	Live assets. (a)				
1	The United States.	34	b$5,711,693	$1,151,119	$1,259,801	$3,106,216	$194,557	159	150	11	314
2	Alabama	1	169,193	10,000	50,000	109,193		20	4		68
3	Colorado	1	65,500	3,000	2,500	60,000			2		
4	Delaware	2	401,857	55,000	113,493	233,364			5		
5	Illinois	3	443,250	6,000	337,000	100,250			9	3	52
6	Indiana	3	288,000	23,000	47,000	218,000		6	5	1	
7	Kansas	1	300,000	75,000	100,000	125,000			12		
8	Kentucky	2	140,000	20,000	20,000	100,000		35	20	1	
9	Missouri	3	2,379,215	765,000	225,008	1,248,150	141,057	20	23	3	50
10	New Jersey	2	479,000	95,000	162,000	222,000		6	30		
11	New York	1	25,000	5,000	5,000	15,000			2	1	
12	Ohio	6	509,128	24,219	110,500	341,409	33,000	20	17		132
13	Pennsylvania	7	b286,550	42,400	32,800	170,850	20,500	52	14	1	12
14	Tennessee	1	225,000	25,000	50,000	150,000			4	1	
15	Texas	1	20,000	2,500	4,500	13,000			3		

a Includes raw materials, stock in process and finished products on hand, and cash, bills and accounts receivable, and sundries not elsewhere reported.

AND STEEL WORKS, BY STATES: 1890—Continued.

EQUIPMENT AND CAPACITY.																			
Number of single puddling furnaces.	Number of heating furnaces.	Number of hammers.	Number of cut nail machines.	Converters.		Open-hearth furnaces.		Number of soaking pits.	Number of cementing furnaces.	Number of crucible pots which can be used at each heat.	Number of trains of rolls.	Aggregate daily capacity in tons of finished products.	Power.						
													Steam.			Water.			
				Number.	Total daily capacity in tons of ingots.	Number.	Total daily capacity in tons of ingots.						Number of boilers.	Number of engines.	Horse power.	Number of water wheels.	Horse power.	Number of turbine wheels.	Horse power.
4,694	2,762	614	5,595	a92	20,934	122	8,853	43	48	2,270	1,474	45,181	5,992	3,702	525,836	18	1,755	84	6,477
117	31	5	.....	.....	.....	1	15	.....	.....	.....	28	440	62	74	10,395	.....	.....	.....	.....
6	35	19	98	.....	.....	2	40	.....	.....	.....	15	303	82	56	5,765	.....	.....	.....	.....
12	39	18	.....	.....	.....	.....	.....	.....	2	124	17	141	43	24	2,325	.....	.....	4	425
66	33	8	.....	.....	.....	.....	.....	.....	.....	.....	30	266	110	50	5,130	.....	.....	2	90
81	70	8	428	16	5,667	8	125	8	.....	30	60	5,626	292	257	31,012	.....	.....	.....	.....
117	61	15	342	2	120	2	120	.....	1	16	33	966	121	79	10,480	.....	.....	.....	.....
60	23	5	126	.....	.....	.....	.....	.....	.....	.....	19	340	38	33	4,100	.....	.....	.....	.....
45	44	10	.....	.....	.....	.....	.....	.....	1	24	24	182	32	27	3,200	5	550	.....	.....
22	91	13	311	4	290	2	60	8	.....	64	45	1,099	229	115	13,820	4	90	14	675
13	58	19	.....	2	20	.....	.....	.....	.....	30	11	268	44	32	4,300	.....	.....	.....	.....
14	28	19	.....	.....	.....	.....	.....	.....	.....	.....	10	156	28	18	2,775	.....	.....	.....	.....
141	98	45	216	.....	.....	4	100	.....	14	266	61	739	265	164	23,910	2	280	9	441
168	125	28	40	2	700	2	28	.....	7	202	69	1,382	205	103	17,385	1	600	10	1,415
821	330	44	1,177	11	1,690	22	642	2	.....	24	219	5,247	715	494	76,624	.....	.....	2	100
2,707	1,570	330	1,685	46	11,247	78	2,701	23	23	1,470	738	25,207	3,317	1,937	276,335	6	235	23	1,161
33	11	2	74	1	25	.....	.....	.....	.....	20	11	116	35	28	2,200	.....	.....	.....	.....
59	26	7	145	a2	.....	.....	.....	.....	.....	.....	21	533	41	17	1,060	.....	.....	20	2,170
127	31	2	823	4	825	.....	.....	2	.....	.....	26	1,106	111	66	11,225	.....	.....	.....	.....
55	58	17	130	2	350	1	22	.....	.....	.....	37	1,064	222	128	23,795	.....	.....	.....	.....

POWER OF IDLE ROLLING MILLS AND STEEL WORKS: 1890.

CONVERTERS.		OPEN-HEARTH FURNACES.		Number of crucible pots which can be used at each heat.	Number of trains of rolls.	Aggregate daily capacity in tons of finished products.	STEAM POWER.			WATER POWER.			
Number.	Total daily capacity in tons of ingots.	Number.	Total daily capacity in tons of ingots.				Number of boilers.	Number of engines.	Horse power.	Number of water wheels.	Horse power.	Number of turbine wheels.	Horse power.
5	665	7	188	336	83	1,384	245	159	20,170	2	150	4	280
.....	.....	.....	.....	.....	3	40	8	5	750	.....	.....	.....	.....
.....	.....	.....	.....	.....	2	30	6	3	250	.....	.....	.....	.....
.....	.....	.....	.....	.....	3	2	6	2	250	2	150	.....	.....
1	75	.....	.....	.....	4	115	15	11	735	.....	.....	.....	.....
1	30	1	6	4	3	31	11	13	3,040	.....	.....	.....	.....
.....	.....	.....	.....	.....	6	50	4	6	1,100	.....	.....	.....	.....
.....	.....	1	7	.....	12	240	35	22	1,325	.....	.....	.....	.....
2	500	.....	.....	.....	10	310	31	21	4,615	.....	.....	.....	.....
.....	.....	.....	.....	320	8	70	23	16	1,545	.....	.....	.....	.....
.....	.....	.....	.....	.....	1	8	.....	.....	.....	.....	.....	2	200
.....	.....	3	135	12	14	211	48	26	3,450	.....	.....	.....	.....
.....	.....	.....	.....	.....	13	187	56	29	2,660	.....	.....	2	80
1	60	2	40	.....	2	75	2	5	450	.....	.....	.....	.....
.....	.....	.....	.....	.....	2	15	.....	.....	.....	.....	.....	.....	.....

b Includes $18,000 hired property.

TABLE 3.—DETAILED STATEMENT, FORGES

	STATES.	Number of establishments.	CAPITAL. Total.	Land.	Buildings.	Machinery, tools, and implements.	Live assets. (a)	Miscellaneous expenses. (b)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. Aggregates. Average number.	Total wages.	Officers or firm members actively engaged in the industry or in supervision. Males above 16 years. Number.	Wages	Clerks. Males above 16 years. Number.	Wages.
1	The United States	20	$876,470	$130,700	$112,500	$225,500	$407,770	$54,680	486	$216,374	11	$16,100	4	$1,209
2	New York	9	517,434	70,500	52,500	110,000	284,434	40,948	154	61,050	7	10,800	.....	.....
3	All other states (c)	11	359,036	60,200	60,000	115,500	123,336	13,732	332	155,324	4	5,300	4	1,209

	STATES.	MATERIALS USED. Total cost.	Iron ore. Tons.	Cost.	Pig iron. Tons.	Cost.	Old or scrap iron. Tons.	Cost.	Charcoal. Bushels.	Cost.	Anthracite coal. Tons.	Cost.	Bituminous coal. Tons.	Cost.	Coke. Tons.	Cost.	Cost of all other materials.
1	The United States	$905,208	18,807	$110,587	8,227	$145,867	24,000	$359,777	4,056,435	$270,082	398	$946	1,300	$3,300	1,405	$5,604	$9,045
2	New York	279,503	18,807	110,587	.....	.....	.....	.....	2,733,180	167,221	.....	.....	.....	.....	.....	.....	1,695
3	All other states	625,705	.....	.....	8,227	145,867	24,000	359,777	1,323,255	102,861	398	946	1,300	3,300	1,405	5,604	7,350

a Includes raw materials, stock in process and finished products on hand, and cash, bills and accounts receivable, and sundries not elsewhere reported.
b Includes rent, taxes, insurance, interest paid on cash used in the business, and all sundries not elsewhere reported.

CAPITAL, EQUIPMENT, AND DAILY CAPACITY AND

	STATES.	Number of establishments.	CAPITAL. Total.	Land.	Buildings.	Machinery, tools, and implements.	Live assets. (a)	Number of forge fires.
1	The United States	12	$198,500	$68,000	$41,300	$83,200	$6,000	62
2	Alabama	1	8,200	5,000	2,000	1,200	.....	5
3	Maryland	1	60,000	5,000	7,000	48,000	.....	12
4	New Jersey	2	19,300	4,500	2,300	6,500	6,000	6
5	New York	2	17,000	11,000	2,000	4,000	.....	8
6	Pennsylvania	5	90,000	40,000	27,000	23,000	.....	29
7	Virginia	1	4,000	2,500	1,000	500	.....	2

a Includes raw materials, stock in process and finished products on hand, and cash, bills and accounts receivable, and sundry items of capital not elsewhere reported.

AND BLOOMERIES, BY STATES: 1890.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.						WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, EXCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS.													
Operatives and skilled.		Unskilled				Aggregates.		Males above 16 years.										Children.	
Males above 16 years.		Males above 16 years.		Children.															
Number.	Wages.	Number.	Wages.	Number.	Wages.	Average number.	Total Wages.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	Under $5.	
317	$150,943	151	$47,762	3	$360	471	$199,065	468	6	11	35	65	58	36	113	102	42	3	1
108	39,099	39	11,151	.....	.....	147	50,250	147	.....	1	8	34	5	10	71	13	5	.....	2
209	111,844	112	36,611	3	360	324	148,815	321	6	10	27	31	53	26	42	89	37	3	3

PRODUCTS.								EQUIPMENT AND CAPACITY.									
Aggregate value.	Blooms and bars.						Value of all other products.	Number of forge fires.	Hammers.		Power.						
	Total.		From ore.		From pig and scrap iron.						Steam.			Water.			
	Tons.	Value.	Tons.	Value.	Tons.	Value.			Number.	Total capacity in tons of blooms or bars.	Number of boilers.	Number of engines.	Horse power.	Number of water wheels.	Horse power.	Number of turbine wheels.	Horse power.
$1,183,494	34,775	$1,178,011	9,347	$356,843	25,428	$821,168	$5,483	140	27	222	16	9	432	20	715	7	215	1
356,843	9,347	356,843	9,347	356,843	.....	.....	.....	61	13	80	.....	.....	.....	16	590	4	135	2
826,651	25,428	821,168	.....	.....	25,428	821,168	5,483	79	14	142	16	9	432	4	125	3	80	3

c Includes states grouped in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Maryland, 1; New Jersey, 1; Pennsylvania, 9.

POWER OF IDLE FORGES AND BLOOMERIES: 1890.

HAMMERS.		STEAM POWER.			WATER POWER.				
Number.	Daily capacity in tons of blooms or bars.	Number of boilers.	Number of engines.	Horse power.	Number of water wheels.	Horse power.	Number of turbine wheels.	Horse power.	
12	73	12	8	500	8	280	6	224	1
1	10	2	1	50	.....	.....	.....	.....	2
1	7	4	1	200	.....	.....	1	50	3
2	7	2	2	110	.....	.....	.....	.....	4
2	8	.....	.....	.....	4	160	1	30	5
5	39	4	4	140	3	95	4	144	6
1	2	.....	.....	.....	1	25	.....	.....	7

CAST IRON PIPE INDUSTRY.

CAST IRON PIPE INDUSTRY.

The manufacture of cast iron pipe is confined almost exclusively to establishments devoted to this class of work as a specialty. On account of the distinctive character of the industry it has been possible to separate the statistics of the pipe works from the operations of foundries engaged in the production of miscellaneous castings. A comparatively small amount of iron pipe is made by foundries devoted to general work, but as the pipe thus produced is chiefly for local trade or for specific purposes no account has been taken of the output in this report. The demand for standard sizes of cast iron pipe necessitates its manufacture on a large scale in plants especially equipped for this work, although many of them also produce hydrants, fittings, and connections. A few of the pipe manufacturers make hydraulic and gas machinery, and general foundry and machine shop products, but this work forms only a small part of the aggregate business of these establishments.

The statistics relating to cast iron pipe were included in the totals for the general foundry and machine shop industry at the censuses of 1880 and 1890. For the purposes of this report, however, a separation was made at the census of 1890, which was not done at the census of 1880; therefore comparative data are not available.

There were 33 establishments in the United States reported as engaged princially in the manufacture of cast iron pipe during the census year 1890. The statistics of this industry are given in the following summary:

SUMMARY, CAST IRON PIPE INDUSTRY, BY STATES: 1890.

STATES.	Number of establishments reporting.	Capital.	Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		Cost of materials used.	Value of products.
				Employés.	Wages.		
The United States	33	$14,179,733	$622,614	7,579	$3,792,557	$9,453,652	$15,182,652
New York / Massachusetts	3	589,463	36,859	337	163,244	266,658	516,421
New Jersey	6	4,543,204	197,173	2,284	1,217,813	3,099,652	5,032,571
Pennsylvania	6	1,320,407	56,918	709	344,459	984,420	1,510,755
Southern states (c)	8	3,561,162	160,461	1,964	934,791	2,256,258	3,714,293
Ohio	4	1,950,311	84,182	1,067	550,054	1,405,425	2,189,565
Other western states (d)	6	2,215,186	87,021	1,218	582,196	1,441,239	2,219,047

a Includes 175 officers, firm members, and clerks, and their wages, amounting to $282,011, distributed as follows: New York and Massachusetts 4, $6,447; New Jersey 41, $72,468; Pennsylvania 34, $32,676; southern states 44, $90,135; Ohio 24, $31,320; other western states 28, $48,965.

b Does not include 2 idle establishments located in Pennsylvania reporting capital amounting to $68,500.

c Includes establishments located as follows: Alabama, 1; Kentucky, 2; Tennessee, 2; Texas, 1; Virginia, 2.

d Includes establishments located as follows: Colorado, 1; Michigan, 1; Missouri, 2; Oregon, 1; Wisconsin, 1.

Of the 6 establishments in the group of "Other western states" 5 have been built and put in operation since 1880.

The oldest seat of the cast iron pipe industry is in eastern Pennsylvania and the adjoining sections of New Jersey, the largest works being located in the immediate vicinity of Philadelphia, Pa. One establishment, situated in Millville, N. J., has been in operation since 1803, but it did not begin the manufacture of pipe until some years later. Two other establishments in this section were established prior to 1850, and 5 establishments were built and put in operation between 1850 and 1880. During the last decade 5 cast iron pipe foundries have been built in this territory. The older establishments in this section are all of large size, while those recently built are of comparatively small capacity. During the census year 1890 the pipe foundries in Pennsylvania and New Jersey produced 43 per cent of the total output. Until within recent years the establishments in these states supplied the demands of almost the entire country, but the advance in municipal improvement in the west and the southwest, and the growth of the pig iron industry in those sections have resulted in the establishment of large plants nearer to the new markets and at points where pig iron and fuel are cheap.

It has been found impossible to obtain accurate statistics concerning the manufacture of cast iron pipe during the census year of 1880. The growth of the industry during the past 10 years is indicated by the large number of

establishments erected since 1880. Of the 35 establishments reporting, including 2 that were idle during 1890, 19 were built since 1880 and 16 were erected prior to that year. By far the larger number of the establishments built during the past decade are located in the southern and western sections of the country, and the majority of them are of large capacity.

MISCELLANEOUS EXPENSES.

The questions pertaining to miscellaneous expenses were generally correctly answered, though in some cases manufacturers found difficulty in making a proper separation of those items belonging to the mercantile part of the business and those chargeable to manufacturing operations.

The following statement shows the different items of miscellaneous expenses as reported by the manufacturers of cast iron pipe at the census of 1890:

MISCELLANEOUS EXPENSES, CAST IRON PIPE INDUSTRY, BY STATES: 1890.

STATES.	MISCELLANEOUS EXPENSES.						
	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.
The United States	$622,614	$12,365	$41,164	$32,017	$189,906	$150,283	$196,879
New York, Massachusetts	36,859	1,035	3,293	2,018	1,990	1,095	27,428
New Jersey	197,173	7,655	14,607	7,601	45,806	48,872	72,632
Pennsylvania	56,918	.....	3,326	2,482	25,790	17,794	7,526
Southern states	160,461	1,475	9,208	11,147	29,081	52,522	57,028
Ohio	84,182	1,200	5,143	4,154	28,880	17,640	27,165
Other western states	87,021	1,000	5,587	4,615	58,359	12,360	5,100

EMPLOYÉS AND WAGES.

In the following statement are given the average number and total wages of officers or firm members and clerks and the average number and total wages of skilled and unskilled employés and pieceworkers for the cast iron pipe industry for the census year 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, CAST IRON PIPE INDUSTRY: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					
	Aggregates.		Males above 16 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.
All classes (a)	7,579	$3,792,557	7,546	$3,786,240	33	$6,317
Officers or firm members	69	187,465	69	187,465	.....	.....
Clerks	106	94,546	106	94,546	.....	.....
Skilled	2,505	1,575,780	2,505	1,575,780	.....	.....
Unskilled	4,636	1,785,812	4,603	1,779,495	33	6,317
Pieceworkers	263	148,954	263	148,954	.....	.....

a Includes convict laborers in the Texas penitentiary receiving an average of 50 cents each per day.

The following statement shows the weekly rates of wages paid, and the average number of employés at each rate, not including those employed on piecework:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, CAST IRON PIPE INDUSTRY: 1890.

[INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT PIECEWORKERS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.	
	Males above 16 years.	Children.
Total (a)	7,283	33
Under $5	224	22
$5 and over but under $6	115	10
$6 and over but under $7	607	1
$7 and over but under $8	1,260	.....
$8 and over but under $9	1,322	.....
$9 and over but under $10	1,018	.....
$10 and over but under $12	875	.....
$12 and over but under $15	927	.....
$15 and over but under $20	665	.....
$20 and over but under $25	160	.....
$25 and over	110	.....

a Includes convict laborers in the Texas penitentiary receiving an average of 50 cents each per day.

During the census year 1890 the cast iron pipe foundries were in operation an average of 9.45 months each and the average term of employment was 10.97 months, the excess of the average term of employment over the average term of operation being caused by the fact that the establishments having the greatest number of employés also report the maximum term of operation.

MATERIALS USED.

In the following statement are given the total quantity and cost of the pig iron used and the total cost of the fuel and other materials consumed by the cast iron pipe works during the census year 1890:

QUANTITY AND COST OF MATERIALS USED, CAST IRON PIPE INDUSTRY, BY STATES: 1890.

STATES.	MATERIALS USED.					
	Total cost.	Pig iron.		Cost of fuel.	Cost of mill supplies.	Cost of all other materials.
		Tons (of 2,000 pounds).	Cost.			
The United States	$9,453,652	573,226	$7,926,104	$652,495	$65,751	$809,302
New York, Massachusetts	266,658	11,183	188,825	23,372	480	53,981
New Jersey	3,099,652	190,202	2,677,548	192,712	5,207	224,185
Pennsylvania	984,420	57,577	851,077	54,538	20,621	58,184
Southern states	2,256,258	146,263	1,920,200	156,520	4,580	174,958
Ohio	1,405,425	90,813	1,156,617	122,537	27,970	98,301
Other western states	1,441,239	77,188	1,131,837	102,816	6,893	199,693

Most of the establishments used pig iron exclusively in the manufacture of pipe, a few report the consumption of a small quantity of purchased scrap iron, the cost of which is included in the "Cost of all other materials" which also covers the amount paid for miscellaneous foundry supplies and for materials consumed in the manufacture of products other than cast iron pipe.

PRODUCTS.

The quantities and values of cast iron pipe made during the census year 1890 are given in the following statement, together with the values of other castings and products. The quantities are in tons of 2,000 pounds.

QUANTITY AND VALUE OF PRODUCTS, CAST IRON PIPE INDUSTRY, BY STATES: 1890.

STATES.	PRODUCTS.				
	Total value.	Pipe.		Value of other castings.	Value of all other products.
		Tons.	Value.		
The United States	$15,182,652	513,250	$13,091,209	$1,657,525	$433,918
New York, Massachusetts	516,421	13,066	412,382	74,008	30,031
New Jersey	5,032,571	185,510	4,800,590	173,499	58,482
Pennsylvania	1,510,755	48,860	1,225,440	210,315	75,000
Southern states	3,714,293	128,253	3,178,175	491,568	44,550
Ohio	2,189,565	73,734	1,829,680	304,030	55,855
Other western states	2,219,047	63,827	1,644,942	404,105	170,000

The item of "other castings" is made up chiefly of pipe fittings and specials, and also includes some general foundry products. The "all other products" embrace valves, gates, hydrants, gas and water machinery, and miscellaneous machine work. The gates, valves, and hydrants made by the pipe foundries constitute only a small portion of the aggregate production of these fittings, as the manufacture of this class of products forms in itself an important industry.

No account has been taken in this statement of a number of establishments that were in course of erection during the census year 1890, but which were not completed and put in operation during that year.

WROUGHT IRON AND STEEL PIPE.

WROUGHT IRON AND STEEL PIPE.

The wrought iron and steel pipe industry has made considerable progress since the census of 1880, the natural growth attending the increase in population and the new uses found for the products stimulating the consumption to a marked degree. The development of oil fields in New York, Pennsylvania, and Ohio; the discovery of natural gas in various parts of the country, and the construction of pipe lines to industrial centers; the growth of steam and hot water heating; and the change which has taken place in recent years in the whole system of refrigeration on a large scale have exerted a remarkable impetus to the wrought iron pipe industry. Since 1880 extensive additions and improvements have been made to existing works and new plants erected to meet the increased demand, the daily productive capacity more than doubling during this period. The census of 1880 reported 35 wrought iron pipe establishments with an invested capital of $6,129,565. These works reported 5,210 employés and $1,788,258 wages, consumed materials costing $9,480,049, and produced pipe and fittings valued at $13,292,162. Careful inquiry among manufacturers who are engaged in the production of wrought iron pipe in 1880 indicate that the above figures undoubtedly include the reports of concerns manufacturing riveted and other forms of pipe not considered by the trade as being included under the classification of "Wrought iron and steel pipe". As the statistics for 1890 include only those establishments which manufacture wrought iron or steel merchant pipe, boiler tubes, oil well casing, and other similar forms of products from iron or steel plate, or skelp by the process of butt or lap welding, accurate comparisons can not be made with the figures for the census of 1880. The figures shown herein will not agree with those for "Iron and steel pipe, wrought", in the general statistics of manufactures at the Eleventh Census. The general statistics contain the returns of 2 manufacturers of pipe which have been excluded from this report because their products were not considered as coming within the meaning of the term "Wrought iron and steel pipe" as known to the trade. In addition, the totals in this report contain 2 returns not included in the general statistics, 1 from Ohio being received too late for inclusion in the general tabulations, and 1 from West Virginia, which formed a part of a large iron and steel establishment, the entire report being tabulated under the classification of "Iron and steel" in the general statistics, but for the purposes of this report the pipe mill has been separated and included in the following figures.

The following summary presents the statistics of the manufacture of wrought iron and steel pipe, as reported at the census of 1890, by states:

SUMMARY, WROUGHT IRON AND STEEL PIPE, BY STATES: 1890.

STATES.	Number of establishments reporting.	Capital.	Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		Cost of materials used.	Value of products.
				Employés.	Wages.		
The United States	22	$23,703,096	$1,111,688	12,829	$6,107,547	$28,250,000	$40,722,453
Pennsylvania	14	18,876,209	871,216	9,439	4,634,606	20,597,831	30,249,796
New York	2	2,127,015	201,633	1,125	425,986	2,858,212	3,850,715
Delaware	1						
Illinois	2	2,699,872	98,839	2,265	1,046,955	4,793,957	6,621,942
Ohio	2						
West Virginia	1						

a Includes 400 officers, firm members, and clerks, and their wages amounting to $480,888, distributed as follows: Pennsylvania 265, $344,021; New York and Delaware 23, $24,750; Illinois, Ohio, and West Virginia 112, $112,117.

MISCELLANEOUS EXPENSES.

The following statement shows the different items of miscellaneous expenses, as reported by the manufacturers of wrought iron and steel pipe at the census of 1890:

MISCELLANEOUS EXPENSES, WROUGHT IRON AND STEEL PIPE, BY STATES: 1890.

STATES.	MISCELLANEOUS EXPENSES.						
	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.
The United States	$1,111,688	$10,443	$89,046	$29,260	$151,292	$216,020	$615,627
Pennsylvania	811,216	10,043	81,716	19,881	127,792	188,090	383,694
New York							
Delaware	201,633	400	4,003	4,448	23,500	9,800	159,482
Illinois							
Ohio	98,839		3,327	4,931		18,130	72,451
West Virginia							

EMPLOYÉS AND WAGES.

The following statement gives the average number and total wages of each class of employés engaged in the manufacture of wrought iron and steel pipe in 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, WROUGHT IRON AND STEEL PIPE: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates.		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
All classes	12,829	$6,107,547	12,536	$6,045,972	8	$3,671	285	$57,904
Officers or firm members	55	194,794	55	194,794				
Clerks	345	286,094	341	283,919	4	2,175		
Skilled	5,922	3,287,278	5,922	3,287,278				
Unskilled	5,910	2,038,423	5,622	1,979,223	4	1,496	284	57,704
Pieceworkers	597	300,958	596	300,758			1	200

The following statement presents the weekly rates of wages and the average number of employés at each rate, not including officers, firm members, clerks, or pieceworkers:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, WROUGHT IRON AND STEEL PIPE: 1890.

[NOT INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, OR PIECEWORKERS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	11,544	4	284
Under $5	107		235
$5 and over but under $6	282		29
$6 and over but under $7	1,105		13
$7 and over but under $8	1,409		7
$8 and over but under $9	3,184	4	
$9 and over but under $10	1,803		
$10 and over but under $12	1,123		
$12 and over but under $15	1,167		
$15 and over but under $20	718		
$20 and over but under $25	363		
$25 and over	283		

During the census year 1890 the works were in operation an average of 9.97 months each, and the average term of employment was 10.35 months. The excess of the average term of employment over the average term of operation being caused by the fact that the establishments reporting the greatest number of employés also report the maximum term of operation.

MATERIALS USED.

The following statement shows the quantity and cost of the skelp iron and skelp steel consumed in the manufacture of wrought iron and steel pipe and the total cost of fuel and other materials used during the census year 1890. All the quantities given in this report are in tons of 2,000 pounds.

QUANTITY AND COST OF MATERIALS USED, WROUGHT IRON AND STEEL PIPE, BY STATES: 1890.

STATES.	Total cost of all materials.	SKELP IRON.		SKELP STEEL.		Cost of fuel.	Cost of mill supplies.	Cost of all other materials.
		Tons.	Cost.	Tons.	Cost.			
The United States	$28,250,000	583,835	$22,498,775	34,605	$1,454,694	$1,098,316	$386,107	$2,812,108
Pennsylvania	20,597,831	462,051	17,733,147	3,600	137,500	882,963	297,944	1,546,277
New York, Delaware	2,858,212	48,780	2,066,020	12,048	568,947	100,028	36,492	86,725
Illinois, Ohio, West Virginia	4,793,957	73,004	2,699,608	18,957	748,247	115,325	51,671	1,179,106

A classification of the fuel consumed in 1890 is made in the following statement, the tons and cost of the coal and coke and the total cost of natural gas and fuel oil being shown separately:

FUEL CONSUMED, WROUGHT IRON AND STEEL PIPE, BY STATES: 1890.

STATES.	Total cost of fuel.	BITUMINOUS COAL.		COKE.		NATURAL GAS.	OIL.
		Tons.	Cost.	Tons.	Cost.	Cost.	Cost.
The United States	$1,098,316	259,752	$591,861	2,008	$6,775	$433,145	$66,535
Pennsylvania	882,963	165,379	411,862	608	1,595	427,759	41,747
New York, Delaware	100,028	31,710	100,028				
Illinois, Ohio, West Virginia	115,325	62,663	79,971	1,400	5,180	5,386	24,788

PRODUCTS.

In the following statement is given the quantities and values of the wrought iron and steel pipe made in the census year 1890, together with the value of all other products:

TONNAGE AND VALUE OF PRODUCTS, WROUGHT IRON AND STEEL PIPE, BY STATES: 1890.

STATES.	Total value of all products.	WROUGHT IRON AND STEEL PIPE AND BOILER TUBES.				Value of all other products.
		Iron.		Steel.		
		Tons.	Value.	Tons.	Value.	
The United States	$40,722,413	583,248	$37,038,127	29,354	$2,184,251	a$1,500,075
Pennsylvania	30,249,796	460,007	28,994,319	4,050	274,100	981,377
New York, Delaware	3,850,715	48,341	2,904,115	10,004	931,600	15,000
Illinois, Ohio, West Virginia	6,621,942	74,900	5,139,693	15,300	978,551	503,698

a Chiefly pipe fittings.

LOCOMOTIVES.

LOCOMOTIVES.

This report refers only to the manufacture of locomotives in establishments operated by private firms or companies, and takes no account of the business of railroad repair shops. Many of the leading railroad companies devote considerable attention to the manufacture of locomotives for their own use, but in the majority of instances the production of locomotives by the railroads serves only the purpose of keeping the large force of skilled workmen fully employed during periods when the amount of general repair work is not sufficient.

During the census year 1890 there were 20 establishments in the United States prepared to manufacture locomotives, and of this number 19 were in operation during that year. The following summary gives the statistics of the firms or companies which produced locomotives in 1890, the data concerning the railroad repair shops being excluded. Both at the censuses of 1880 and 1890 the statistics of the locomotive works were included in the totals for the foundry and machine shop industry. For the purposes of this report, however, a separation was made at the census of 1890. This was not done at the census of 1880; therefore, comparative data are not available.

SUMMARY, LOCOMOTIVE MANUFACTURE, BY STATES: 1890.

STATES.	Number of establishments reporting.	Capital.	Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.(a)		Cost of materials used.	Value of products.
				Employés	Wages.		
The United States	19	$24,516,574	$991,380	15,995	$9,079,142	$13,338,742	$24,022,756
New England states (b)	4	4,030,075	152,703	2,629	944,760	1,240,728	2,405,021
New York	3	4,716,360	103,050	3,324	1,667,292	2,636,097	4,524,723
Pennsylvania	5	9,625,670	446,422	6,254	3,935,303	5,570,868	11,121,892
Virginia	3	4,014,158	210,289	2,078	1,080,589	1,819,327	3,258,710
All other states (c)	4	2,130,305	78,916	2,310	1,451,198	2,071,722	3,612,410

a Includes 317 officers, firm members, and clerks, and their wages amounting to $381,654, distributed as follows: New England states 18, $34,300; New York 56, $79,842; Pennsylvania 134, $144,689; Virginia 62, $55,903; all other states 47 $66,920.

b Includes establishments distributed as follows: Maine, 1; Massachusetts, 1; New Hampshire, 1, Rhode Island, 1.

c Includes establishments distributed as follows: Maryland, 1; New Jersey, 2; Ohio, 1.

MISCELLANEOUS EXPENSES.

The following statement shows the different items of miscellaneous expenses, as reported by locomotive manufacturers at the census of 1890:

MISCELLANEOUS EXPENSES, LOCOMOTIVE MANUFACTURE, BY STATES: 1890.

STATES.	MISCELLANEOUS EXPENSES.					
	Total.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	Sundries not elsewhere reported.
The United States	$991,380	$93,860	$48,511	$434,983	$128,962	$285,055
New England states	152,703	16,074	4,720	46,740	20,871	64,298
New York	103,050	10,978	7,427	45,606	29,384	9,655
Pennsylvania	446,422	38,808	22,490	234,616	54,393	96,115
Virginia	210,289	3,774	8,237	88,021	23,089	87,168
All other states	78,916	24,235	5,637	20,000	1,225	27,819

EMPLOYÉS AND WAGES.

The following statement shows the average number and total wages of employés by classes, in the establishments engaged in the manufacture of locomotives during the census year 1890:

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES BY CLASSES, LOCOMOTIVE MANUFACTURE: 1890.

CLASSES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.							
	Aggregates		Males above 16 years.		Females above 15 years.		Children.	
	Average number.	Total wages.	Number.	Wages	Number.	Wages.	Number.	Wages.
All classes	15,995	$9,079,142	15,959	$9,068,895	9	$5,137	27	$5,110
Officers or firm members	45	174,267	45	174,267				
Clerks	272	207,387	263	202,250	9	5,137		
Skilled	9,033	5,743,894	9,009	5,739,084			24	4,810
Unskilled	4,028	1,468,483	4,025	1,468,183			3	300
Pieceworkers	2,617	1,485,111	2,617	1,485,111				

The weekly rates of wages paid, and the average number of employés at each rate, including officers, firm members, and clerks, but not pieceworkers, are shown in the following statement:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, LOCOMOTIVE MANUFACTURE: 1890.

[INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT PIECEWORKERS.]

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	13,342	9	27
Under $5	485		27
$5 and over but under $6	359		
$6 and over but under $7	818		
$7 and over but under $8	1,884	1	
$8 and over but under $9	1,822		
$9 and over but under $10	1,501	3	
$10 and over but under $12	1,239		
$12 and over but under $15	2,692	3	
$15 and over but under $20	1,988	2	
$20 and over but under $25	304		
$25 and over	250		

During the census year 1890 the locomotive establishments were in operation an average of 11.50 months and the average term of employment was 11.62 months, the excess of the average term of employment over the average term of operation being caused by the fact that the establishments reporting the greatest number of employés also report the maximum term of operation.

MATERIALS USED.

The materials consumed by the locomotive establishments are largely of a costly and partly finished character, and are the products of establishments which possess special facilities for manufacturing the various parts entering into the completed engine. The iron and steel plates and sheets, tires, wheels, brass and copper work, boiler tubes, forgings, and other similar articles are in themselves costly products and the cost of assembling and further manufacturing these various articles by the locomotive works into the finished engine is less than half the value of the completed product. As shown by the statistics presented in this report the total amount paid for labor at locomotive works was $9,079,142, and for the general miscellaneous expenses, exclusive of materials, $991,380, a total of $10,070,522, or only 40.41 per cent, while the cost of materials is $13,338,742, or 53.52 per cent of the aggregate value of all products.

PRODUCTS.

The number and value of locomotives made during the year 1890 by the establishments considered in this report are given in the following table, together with the value of all other products and the total value of all products:

QUANTITY AND VALUE OF PRODUCTS OF LOCOMOTIVE MANUFACTURE, BY STATES: 1890.

STATES.	Total value of all products.	LOCOMOTIVES.		Value of all other products.
		Number.	Value.	
The United States	$24,922,756	2,409	$19,752,465	$5,170,291
New England states	2,405,021	233	1,887,015	518,006
New York	4,524,723	513	4,392,683	132,040
Pennsylvania	11,121,892	1,204	9,474,649	1,647,243
Virginia	3,258,710	76	723,048	2,535,662
All other states	3,612,410	383	3,275,070	337,340

While the returns received show that there were 19 establishments in 1890 engaged in the manufacture of locomotives, by far the larger part of the output in that year was produced by a few establishments which make a specialty of locomotive building. Of the 2,409 locomotives built in 1890, 1,215, or over 50 per cent of the total number, were made by 2 establishments, while 6 other establishments produced 834 locomotives, making a total of 2,049 locomotives, or 85.06 per cent of the total production.

The item of other products in the above table includes foundry and general machine shop products, which are produced by a number of the smaller locomotive establishments as a part of their regular business. This item also includes the value of the duplicate parts of locomotives, which contributes a considerable amount to the annual product of the larger plants. The more general employment of the system of making the various parts of the locomotive interchangeable has greatly simplified and cheapened the otherwise laborious and costly work of locomotive repairs by the railroad companies.

With the increased demands upon the railroads in the matter of freight and passenger service there has been a gradual increase in the size and weight of the locomotives employed upon the leading roads.

Considerable attention has been given in recent years to the construction of compound locomotives, various methods being adopted by the different works in the arrangement of the high and low pressure cylinders. The claims of greater efficiency and low fuel consumption, which are made for this type of engine, seem to have been fully met in actual service.

The demands of railroad traffic in this country have absorbed the greater part of the annual product of the locomotive, although there is a foreign demand of considerable magnitude.

CLAY PRODUCTS.

CLAY PRODUCTS.

The schedules of inquiry used at the census of 1890 relating to the manufacture of brick, pottery, and other products in which clay is the principal material, consisted of one (Special Schedule No. 6) intended only for reports of establishments manufacturing building brick as the principal product; one (Special Schedule No. 11) for establishments manufacturing whiteware and similar porcelain products, and one (Special Schedule No. 11*a*) for establishments having stone or earthern ware, terra cotta ware, and sewer pipe or fire brick as their principal products.

The following items are common to schedules 6 and 11*a*, namely: tile, fire brick, and sewer pipe, but the remaining products reported on schedule 11*a* are more properly pottery products, and for this reason the data obtained on schedules 11 and 11*a* have been consolidated, as belonging, for the purpose of this report, under the head of "Clay and pottery products". To this have been added the data obtained on Special Schedule No. 6, which are also presented separately under the head of "Brick and tile", the whole subject being comprehended under the general head of "Clay products".

At the census of 1880 the industries covered by this report were presented under the following heads: "Brick and tile"; "Drain and sewer pipe"; "Stone and earthen ware"; and "Terra cotta ware".

The year covered by this report is the census year ending May 31, 1890.

The following comparative summary presents the statistics for the industry in entirety under the head of "Clay products", and also for the two branches, "Clay and pottery products" and "Brick and tile", respectively:

COMPARATIVE SUMMARY, CLAY PRODUCTS, CLAY AND POTTERY PRODUCTS, AND BRICK AND TILE: 1880 AND 1890.

ITEMS	Year.	Total clay products.	Clay and pottery products.	Brick and tile.
Number of establishments reporting	1880	6,383	752	5,631
	1890	6,535	707	5,828
Capital	1880	$35,039,939	$7,366,323	$27,673,616
	1890	108,705,670	26,127,104	82,578,566
Miscellaneous expenses (*a*)	1880			
	1890	$7,111,776	$2,003,007	$5,108,769
Average number of employés (aggregate)	1880	76,576	10,221	66,355
	1890	129,447	20,296	109,151
Total wages	1880	$17,044,259	$3,600,727	$13,443,532
	1890	42,833,332	10,138,143	32,695,189
Officers, firm members, and clerks: (*b*)				
Average number	1880			
	1890	6,291	1,316	4,975
Total wages	1880			
	1890	$4,254,943	$1,269,111	$2,985,832
All other employés: (*b*)				
Average number	1880			
	1890	123,156	18,980	104,176
Total wages	1880			
	1890	$38,578,389	$8,869,032	$29,709,357
Cost of materials used	1880	$12,683,897	$2,909,063	$9,774,834
	1890	18,257,998	5,618,401	12,639,597
Value of products	1880	$41,810,920	$8,977,333	$32,833,587
	1890	89,827,785	22,057,090	67,770,695

a This item was not reported at the census of 1880. *b* Not reported separately at the census of 1880.

From the above summary it appears that the number of establishments reported for the industry in entirety shows an increase of 152 during the decade, and the value of products an increase of $48,016,865, or 114.84 per cent.

The number of establishments classed as manufacturers of "Clay and pottery products" has decreased from 752 to 707, while the value of products has increased from $8,977,333 to $22,057,090, or 145.70 per cent. The number of establishments manufacturing "Brick and tile" has increased from 5,631 to 5,828, and the value of products from $32,833,587 to $67,770,695, or 106.41 per cent.

Owing to differences in the form of the inquiry and in the method of collecting the data, it is not practicable to make complete comparisons of the statistics for the two census periods. The result of these differences is most apparent in the statistics of capital and wages.

The form of question used at the census of 1880 respecting capital was as follows: "Capital (real and personal) invested in the business". The various subheads into which the general inquiry of 1890 is divided will be found in Tables 3 and 7 accompanying this report, and it is believed they embrace all the items which represent capital except the value of hired property, which is not included in the statistics concerning this industry.

In the manufacture of clay and pottery products the value of plant constituted 59.73 per cent and the value of live assets 40.27 per cent of the aggregate capital, while in the manufacture of brick and tile the value of plant is 64.94 per cent and live assets 35.06 per cent of the aggregate capital.

The inquiry concerning employés and wages used at the Tenth Census called for the average number of males above 16 years, females above 15 years, and children, respectively, employed during the year and the total amount paid in wages, without designating the different classes.

The classification used at the Eleventh Census was as follows: first, operatives, engineers, and other skilled workmen; overseers and foremen or superintendents (not general superintendents or managers); second, officers or firm members; third, clerks; fourth, watchmen, laborers, teamsters, and other unskilled workmen; fifth, pieceworkers not included in the foregoing.

The questions required a statement of the average number of males above 16 years, females above 15 years, and children, respectively, employed during the year in each class, also the actual amount of wages paid to each number, and the average number of males above 16 years, females above 15 years, and children, respectively, employed at specified weekly rates of wages, exclusive of those reported as employed on piecework.

Of the different classes of employés reported for the entire industry it appears there were 5,021 officers or firm members, or 3.88 per cent of all the employés, receiving $3,390,766 as wages, or 7.91 per cent of the total wages paid in the industry. There were 1,270 clerks, or 0.98 per cent of the employés, reported as receiving $864,177 as wages, or 2.02 per cent of the total wages, while the operatives, skilled and unskilled employés, and pieceworkers were 123,156 in number, or 95.14 per cent of all the employés, and received $38,578,389 as wages, or 90.07 per cent of the total wages.

Considering the employés for the entire industry, and for "Clay and pottery products" and "Brick and tile", the following statement shows the average number of males above 16 years, females above 15 years, and children, and the percentage each is of the total number of employés:

AVERAGE NUMBER OF MALES ABOVE 16 YEARS, FEMALES ABOVE 15 YEARS, AND CHILDREN, WITH PERCENTAGES OF TOTAL NUMBER OF EMPLOYÉS, CLAY PRODUCTS: 1890.

[INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS; ALSO PIECEWORKERS.]

BRANCHES.	Average number of employés.	MALES ABOVE 16 YEARS.		FEMALES ABOVE 15 YEARS.		CHILDREN.	
		Average number.	Per cent of total.	Average number.	Per cent of total.	Average number.	Per cent of total.
Total clay products	129,447	121,789	94.08	2,337	1.81	5,321	4.11
Clay and pottery products	20,296	17,670	87.06	2,071	10.20	555	2.74
Brick and tile	109,151	104,119	95.39	266	0.24	4,766	4.37

The average number of males above 16 years, females above 15 years, and children, exclusive of those employed on piecework, reported at the different weekly rates of wages in the entire industry and in each of the two branches is shown in the following statement:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, CLAY PRODUCTS: 1890.

[INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK.]

WEEKLY RATES OF WAGES.	TOTAL CLAY PRODUCTS.			CLAY AND POTTERY PRODUCTS.			BRICK AND TILE.		
	Males above 16 years.	Females above 15 years.	Children.	Males above 16 years.	Females above 15 years.	Children.	Males above 16 years.	Females above 15 years.	Children.
Total	113,753	1,786	4,774	15,218	1,580	405	98,535	206	4,369
Under $5	6,269	1,161	3,783	705	1,058	377	5,564	103	3,406
$5 and over but under $6	5,868	190	612	559	169	23	5,309	21	589
$6 and over but under $7	10,248	187	227	627	170	5	9,621	17	222
$7 and over but under $8	15,171	59	a152	1,788	48	.....	13,383	11	a152
$8 and over but under $9	12,109	56	.....	2,020	42	.....	10,089	14	.....
$9 and over but under $10	20,282	61	.....	2,626	53	.....	17,656	8	.....
$10 and over but under $12	17,991	34	.....	2,323	18	.....	15,668	16	.....
$12 and over but under $15	13,449	24	.....	2,257	16	.....	11,192	8	.....
$15 and over but under $20	8,049	9	.....	1,296	4	.....	6,753	5	.....
$20 and over but under $25	2,445	5	.....	474	2	.....	1,971	3	.....
$25 and over	1,872	.....	.....	543	.....	.....	1,329	.....	.....

a $7 and over.

Of the 113,753 male employés reported for the entire industry as receiving wages according to time, 50,382, or 44.29 per cent, received $8 and over but under $12 a week. There are 1,786 females reported, 1,161 of them receiving less than $5 a week. Establishments classed as manufacturing "Clay and pottery products" report 88.47 per cent of the total number of females employed in the entire industry. From Table 5, showing employés by occupations, it appears that females are employed largely as biscuitware brushers, decorators, fillers in, glostware dressers, and spongers.

MATERIALS USED.

No previous census inquiry has comprehended data relating to the cost of manufacture other than statistics of wages and materials. The data presented for 1890 are intended to embrace the entire cost of production other than allowance for depreciation of plant and interest on capital.

The difference between the cost and the value shown must not be taken as indicating the net profits or earnings of capital, because these statistics contain no information relating to cost of selling, mercantile losses, and depreciation of plant. The census inquiry was intended simply to ascertain the relation which capital, expenses, wages, and cost of materials bear to the value at the works of the products of manufacturing industry, excluding all cost or expenses pertaining to the mercantile portion of the business.

The schedules of inquiry contained a series of questions designed to obtain the total cost of materials used in the manufacture of the products reported, and also the quantity and cost of each of the specified classes of material. The results of the inquiry are presented in Tables 3 and 7, but they should not be accepted as statements of the exact quantities and cost of the respective classes or kinds of materials, because in some instances the individual reports did not contain complete information relating to all details, and in others the cost of some of the materials was included in other items of expense. Where clay and sand were mined by the establishments reporting no quantity was reported, but the cost is embraced by the amount reported as paid for labor; also, where natural gas was used for fuel no cost was reported under the head of "Fuel", because the gas was obtained from wells on the premises, and the annual cost for labor, piping, and other purposes is embraced by replies under other heads.

It is probable that the data presented under the head "All other clay and cement", in Table 3, contain amounts which should have been distributed to the various specified classes of clay. To some extent the value of "All other materials" represents materials which should have been distributed to the various specified classes of materials, so these classified data should only be accepted as indicating in a general way the relative cost of each class of material as compared with the total cost of all materials used. The relative cost of materials, as reported for the manufacture of "Clay and pottery products", may be more clearly shown by arranging the various classes in four principal groups, as shown in the table on the following page.

COST OF CLASSIFIED MATERIALS AND PERCENTAGE OF EACH CLASS OF TOTAL COST OF ALL MATERIALS, CLAY AND POTTERY PRODUCTS: 1890.

MATERIALS.	Cost.	Percentage of total cost of materials.
Total	$5,618,401	100.00
Clay	2,083,421	37.08
Fuel	1,799,146	32.02
Miscellaneous	1,401,059	24.94
Packing materials	334,775	5.96

CLAY AND POTTERY PRODUCTS.

The classification and grouping of products in Table 3, "Clay and pottery products", are arbitrary, and must not be taken as showing with exactness the total values or quantities of the respective classes of products in the various groups, because it has been found impossible sufficiently to distinguish the data obtained to enable a perfect division and distribution to the different groups. The proportion which each group bears to the total value of products is as follows:

VALUE OF CLASSIFIED PRODUCTS AND PERCENTAGE OF EACH CLASS OF TOTAL VALUE OF ALL PRODUCTS, CLAY AND POTTERY PRODUCTS: 1890.

PRODUCTS.	Value.	Percentage of total value of products.
Total	$22,057,090	100.00
China and fancy ware	3,542,831	16.06
Porcelain and earthenware	6,183,152	28.03
Porcelain, special ware	266,507	1.21
Stoneware	2,056,463	9.32
Terra cotta	2,244,790	10.18
Fire clay products	1,315,449	5.97
Miscellaneous	6,447,898	29.23

Trenton, N. J., and East Liverpool, Ohio, are the principal seats of the clay and pottery industry. The products of these two centers constitute 30.69 per cent of the value of the entire product of the industry in the United States during the census year. The relative importance of each of the cities in the manufacture of "Clay and pottery products" is shown in the following statement:

STATISTICS OF THE CLAY AND POTTERY INDUSTRY AT TRENTON, N. J., AND EAST LIVERPOOL, OHIO: 1890.

ITEMS.	Trenton.	East Liverpool.
Number of establishments reporting	32	23
Capital	$4,875,507	$2,127,281
Value of plant	2,728,913	1,219,543
Live assets	2,146,594	907,738
Miscellaneous expenses	$434,354	$157,421
Average number of employés (aggregate)	4,095	2,155
Total wages	$2,347,701	$1,066,913
Officers, firm members, and clerks:		
Average number	160	93
Total wages	$203,669	$89,844
All other employés:		
Average number	3,935	2,062
Total wages	$2,144,032	$977,069
Cost of materials used	$1,198,090	$669,357
Clay	285,262	171,954
Fuel	261,580	130,448
Miscellaneous	474,874	273,912
Packing materials	176,374	93,043
Value of products	$4,631,202	$2,137,063
China and fancy ware	1,843,029	460,533
Porcelain and earthenware	2,513,865	1,510,661
Porcelain, special ware	14,500	51,000
Terra cotta	42,299	315
Miscellaneous	217,509	114,554

BRICK AND TILE.

The details concerning the quantities and values of the different products reported by establishments classed as "Brick and tile" are shown in Table 7.

The following statement shows the value of each class of products and the percentage that the value of each is of the total value of products reported for this branch of the industry:

VALUE OF CLASSIFIED PRODUCTS AND PERCENTAGE OF EACH CLASS OF TOTAL VALUE OF ALL PRODUCTS, BRICK AND TILE: 1890.

PRODUCTS.	Value.	Percentage of total value of products.
Total	$67,770,695	100.00
Common brick	48,810,271	72.02
Fire brick	5,652,564	8.34
Pressed brick	5,973,902	8.82
Vitrified brick	490,040	0.72
Paving blocks	492,400	0.73
Tile	5,009,804	7.39
All other products	1,341,714	1.98

Sewer pipe, tile, and fire brick are manufactured by establishments classed as "Brick and tile", and also by those classed as "Clay and pottery products". Sewer pipe to the value of $5,394,921, tile to the value of $5,805,762, and fire brick to the value of $6,318,770 were manufactured by establishments reported in both classes.

Of the tabular statements accompanying this report, Tables 1, 2, and 6 are comparative for 1880 and 1890 of the statistics relating to the manufacture of "Clay products" in entirety, and to the two branches of the industry, "Clay and pottery products" and "Brick and tile", respectively, including all data under the principal heads of the inquiry common to both census investigations. The data for "Clay and pottery products" for 1880 include drain and sewer pipe, stone and earthen ware, and terra cotta ware. These classes were shown separately at the Tenth Census. Table 3 presents in detail the statistics reported at the Eleventh Census by establishments manufacturing whiteware and porcelain, stone or earthen ware, terra cotta ware, drain and sewer pipe, or fire brick as their principal product. These establishments are classified as "Clay and pottery products".

The schedule of inquiry respecting whiteware and porcelain products contained questions designed to obtain a statement from each establishment of the number of males above 16 years, females above 15 years, and children, respectively, employed at specified occupations and the rate of daily wages paid to each; also the average number of hours in the ordinary day of labor and the average number of days employed during the year. The results of the inquiry are presented in Table 5. They do not show the total number employed in any of the occupations, because a number of establishments did not reply to these questions. It is believed, however, that the presentation embraces a sufficient number of reports to make it fairly comprehensive and accurate. In considering the average earnings given in this and other tables, it must be remembered that the number of employés includes apprentices.

A large number of apprentices are reported for some branches of the industry, and as they receive comparatively low wages their inclusion tends to lower the average wages obtained from the total for all classes of employés.

Table 7 is a statement presenting in detail the statistics relating to the manufacture of brick and tile as reported at the Eleventh Census.

Table 4 for "Clay and pottery products" and Table 8 for "Brick and tile", contain detailed statistics concerning employés and wages. They present the average number of males above 16 years, females above 15 years, and children employed during the census year 1890, and the average weekly earnings per employé, the respective classes, excepting pieceworkers, for whom the average number and total wages are shown. These tables also show the distribution of the average number of employés at the various weekly rates of wages, excluding pieceworkers, and the average number of hours in an ordinary day of labor.

The number of employés reported is the average number employed during the year, that is, the average number having continuous employment for the full time reported by individual establishments. Upon this basis the computations are made to obtain "Average weekly earnings". The average number of employés reported for each establishment is multiplied by the number of weeks embraced by its term of operation. The result is the number of weeks required for 1 employé to perform the labor. Aggregating such results of individual reports, the number of weeks required for 1 employé to perform the entire labor is obtained. This number, used as a divisor for the total wages reported, produces the true average weekly earnings.

TABLE 1.—COMPARATIVE STATEMENT, CLAY PRODUCTS, BY STATES AND TERRITORIES: 1880 AND 1890.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
The United States	1880	6,383	$35,039,939	76,576	$17,044,259	66,914	1,216	8,446	$12,683,897	$41,810,920
	1890	6,535	108,705,670	129,447	42,833,332	121,789	2,337	5,321	18,257,998	89,827,785
Alabama	1880	51	83,620	612	75,658	469	.....	143	56,323	179,802
	1890	70	742,376	1,641	366,076	1,470	13	158	164,557	802,331
Arizona	1880	1	2,500	10	4,500	10	.....	.....	2,250	9,600
	1890	3	1,210	31	2,600	31	.....	.....	700	4,300
Arkansas	1880	36	41,400	379	54,125	343	.....	36	36,440	120,170
	1890	57	318,262	785	190,008	700	2	83	107,545	520,734
California	1880	60	481,950	950	304,860	948	1	1	186,175	681,961
	1890	64	2,527,673	1,840	889,339	1,835	1	4	621,470	2,266,914
Colorado	1880	46	362,600	830	267,410	797	.....	33	194,003	605,028
	1890	89	1,980,422	2,375	1,186,762	2,309	5	61	395,100	2,238,618
Connecticut	1880	58	455,213	660	183,051	624	9	27	121,522	427,394
	1890	43	1,184,155	1,249	460,456	1,205	31	13	153,523	863,040
Dakota	1880	14	25,600	108	33,622	108	.....	.....	16,366	66,685
	a1890	17	133,700	299	68,442	299	.....	.....	24,218	180,425
Delaware	1880	18	114,400	314	56,316	236	.....	78	36,033	134,110
	b1890	13	250,982	427	143,136	406	.....	21	30,341	268,534
District of Columbia	1880	19	477,350	721	137,311	601	.....	120	70,725	357,948
	1890	18	946,383	1,293	483,550	1,214	.....	79	238,310	961,587
Florida	1880	10	8,850	111	12,808	106	.....	5	9,900	28,950
	b1890	12	139,770	237	60,597	214	1	22	19,805	119,260
Georgia	1880	81	213,835	1,248	190,733	1,039	14	195	116,797	414,250
	1890	78	1,179,532	2,344	563,883	2,275	4	65	285,099	1,412,792
Idaho	1880	2	2,500	11	3,340	11	.....	.....	1,850	6,990
	1890	5	11,405	38	4,710	38	.....	.....	1,690	9,800
Illinois	1880	660	2,593,113	6,296	1,416,385	5,672	16	608	1,052,466	3,379,607
	1890	644	10,670,707	11,209	3,970,760	10,733	57	419	1,495,503	7,956,082
Indiana	1880	770	1,484,814	4,341	747,009	4,006	6	329	712,761	2,018,198
	1890	784	3,447,764	6,496	1,482,284	6,217	72	207	514,651	3,142,454
Iowa	1880	398	542,864	2,434	490,526	2,235	13	186	303,605	1,083,692
	1890	289	2,114,863	3,021	826,981	2,930	11	80	332,393	1,775,165
Kansas	1880	108	133,975	1,066	177,311	967	20	79	92,496	364,448
	1890	93	809,882	1,316	324,536	1,242	6	68	133,397	690,574
Kentucky	1880	130	346,275	1,460	255,812	1,234	1	225	166,153	573,055
	1890	109	1,077,601	2,158	574,731	2,007	20	131	234,075	1,206,181
Louisiana	1880	33	89,425	365	71,576	312	13	40	33,167	143,765
	1890	27	357,003	591	166,818	567	4	20	65,272	336,495
Maine	1880	103	317,649	665	120,838	649	.....	16	134,548	349,908
	1890	127	820,507	1,245	361,905	1,200	40	5	220,092	804,074
Maryland	1880	96	1,311,108	2,537	598,423	2,262	10	265	323,557	1,205,932
	1890	75	3,058,409	3,131	945,272	2,943	70	118	333,945	1,985,828
Massachusetts	1880	138	1,930,500	2,654	578,639	2,604	22	28	592,900	1,620,022
	1890	139	3,825,818	3,771	1,365,437	3,709	55	7	712,942	2,819,760
Michigan	1880	187	736,759	1,967	359,745	1,764	45	158	243,556	853,425
	1890	196	1,950,401	2,824	635,370	2,766	9	49	273,715	1,407,957
Minnesota	1880	92	324,705	1,041	215,170	959	5	77	127,455	544,675
	1890	126	1,827,431	2,402	592,104	2,303	9	90	313,468	1,331,339
Mississippi	1880	56	110,825	737	97,853	621	4	112	45,789	214,370
	1890	36	266,885	742	159,053	692	.....	50	73,100	339,939
Missouri	1880	266	1,271,715	3,006	807,675	2,526	9	471	540,374	1,975,325
	1890	277	6,099,308	5,927	2,260,396	5,532	11	384	1,028,407	4,782,619
Montana	1880	5	17,500	68	21,400	68	.....	.....	11,400	42,150
	1890	11	173,650	252	104,342	250	.....	2	53,088	238,610
Nebraska	1880	88	135,240	675	152,913	598	3	74	103,078	354,293
	b1890	155	2,791,774	2,720	844,850	2,570	5	145	484,918	2,173,632
Nevada	1880	2	1,200	13	3,974	13	.....	.....	1,245	8,355
	1890	(c)	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire	1880	74	186,345	713	148,391	707	2	4	106,685	351,225
	1890	66	597,073	1,534	361,297	1,523	10	1	204,330	835,156
New Jersey	1880	156	3,788,500	5,929	1,766,993	4,629	484	816	1,589,635	4,271,290
	1890	155	10,569,054	9,426	4,126,180	8,291	810	325	1,877,488	7,991,611

a North and South Dakota combined for 1890. b See note d at end of table. c None reported in 1890.

TABLE 1.—COMPARATIVE STATEMENT, CLAY PRODUCTS, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
New Mexico	1880	1	$800	8	$600	8	.....	.....	$500	$1,500
	1890	(a)	.....	.....	.....	.....	.....	.....	.....	.....
New York	1880	386	4,732,105	8,258	1,958,505	7,429	171	658	1,496,218	5,022,024
	1890	331	11,196,350	12,562	4,336,575	12,059	284	219	1,658,608	8,806,273
North Carolina	1880	68	55,990	616	50,028	435	3	178	35,257	152,524
	1890	71	266,790	1,071	154,831	977	1	93	66,663	346,270
North Dakota (b)	1890	6	30,095	80	18,495	80	.....	.....	6,505	45,775
Ohio	1880	1,010	4,538,083	8,943	2,060,685	7,696	243	1,004	1,843,767	5,760,765
	1890	1,000	12,139,977	14,174	4,961,675	13,026	632	516	2,336,160	10,860,938
Oklahoma (c)	1890	3	2,990	16	6,684	16	.....	.....	1,491	11,500
Oregon	1880	23	55,496	187	43,814	184	1	2	19,197	104,240
	d1890	47	656,151	701	237,773	689	.....	12	66,230	461,648
Pennsylvania	1880	624	5,800,069	9,314	2,359,400	7,845	91	1,378	1,566,119	5,561,322
	1890	576	15,607,046	15,283	5,510,187	13,965	135	1,183	2,131,164	11,143,668
Rhode Island	1880	3	108,500	207	36,700	207	.....	.....	27,900	98,000
	1890	4	165,475	151	58,221	151	.....	.....	29,900	133,000
South Carolina	1880	32	37,000	385	38,103	287	2	96	25,708	97,019
	1890	44	244,407	821	131,403	756	.....	65	48,315	279,889
South Dakota (b)	1890	11	103,605	219	49,947	219	.....	.....	17,623	134,650
Tennessee	1880	98	360,254	1,582	252,521	1,248	9	325	141,683	535,373
	1890	88	1,092,100	2,164	677,206	1,962	8	194	195,882	1,277,397
Texas	1880	121	197,630	1,210	212,929	1,067	8	135	111,824	474,688
	1890	143	1,139,561	2,173	617,988	2,110	3	60	267,143	1,311,270
Utah	1880	30	125,575	193	36,690	152	.....	41	20,625	90,392
	d1890	40	279,147	758	232,458	692	.....	66	66,551	421,658
Vermont	1880	28	198,250	252	52,310	244	.....	8	32,735	124,650
	1890	20	139,915	226	48,475	219	1	6	24,535	110,039
Virginia	1880	99	306,935	1,457	194,227	1,209	.....	248	86,935	425,386
	1890	98	1,560,787	2,480	615,130	2,335	.....	145	217,502	1,361,438
Washington	1880	3	4,000	18	2,930	18	.....	.....	1,650	7,500
	1890	90	1,211,158	1,910	734,866	1,882	10	18	233,510	1,529,479
West Virginia	1880	53	268,050	504	127,412	440	3	61	49,169	251,410
	1890	35	289,628	471	144,609	428	3	40	69,949	304,865
Wisconsin	1880	134	656,772	1,493	257,738	1,299	8	186	193,976	708,004
	1890	153	2,573,733	2,969	749,615	2,874	10	85	409,132	1,785,442
Wyoming	1880	2	1,500	28	5,300	28	.....	.....	1,400	8,500
	1890	7	28,970	31	11,410	31	.....	.....	3,723	25,900
All other states	d1890	7	257,485	162	82,351	146	4	12	38,398	182,300

a None reported in 1890.
b See Dakota.
c Part of Indian territory in 1880, from which no reports were received.
d Includes states having less than 3 establishments in either branch of the industry, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Clay and pottery products: Delaware, 2; Florida, 1; Nebraska 1; Oregon, 1; Utah, 1. Brick and tile: Indian territory, 1.

TABLE 2.—COMPARATIVE STATEMENT, CLAY AND POTTERY PRODUCTS, BY STATES AND TERRITORIES: 1880 AND 1890.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
The United States	1880	752	$7,366,323	10,221	$3,600,727	7,882	948	1,391	$2,909,063	$8,977,333
	1890	707	26,127,104	20,296	10,138,143	17,670	2,071	555	5,618,401	22,057,090
Alabama	1880	13	5,095	45	7,261	41	.....	4	3,098	19,850
	1890	11	37,208	62	15,387	51	.....	11	3,803	23,381
Arkansas	1880	4	2,700	4	350	4	.....	.....	440	2,800
	1890	9	22,234	76	22,333	56	2	18	7,438	35,849
California	1880	10	103,300	111	94,825	110	1	.....	28,550	165,700
	1890	12	1,048,682	393	260,497	393	.....	.....	276,121	895,260
Colorado	1880	(a)	.....	.....	.....	.....	.....	.....	.....	.....
	1890	6	232,640	121	87,249	115	.....	6	88,167	215,542
Connecticut	1880	10	126,863	119	50,575	113	.....	6	30,500	128,200
	1890	15	212,445	257	143,256	232	17	8	47,593	267,840
Delaware	1880	3	12,000	7	1,100	6	.....	1	2,350	8,500
	b1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
District of Columbia	1880	3	146,750	25	14,150	25	.....	.....	8,150	43,650
	1890	5	173,702	89	40,621	89	.....	.....	29,880	114,637
Florida	1880	1	1,000	4	350	2	.....	2	150	850
	b1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	1880	5	1,175	20	1,850	17	.....	3	1,050	5,225
	1890	17	229,269	264	90,011	258	4	2	31,177	211,250
Illinois	1880	44	196,090	393	127,781	353	3	37	96,882	314,305
	1890	40	1,675,108	1,512	753,934	1,432	37	43	426,134	1,556,590
Indiana	1880	35	76,550	101	30,755	98	2	1	18,535	90,340
	1890	20	266,020	359	165,164	304	55	.....	65,456	313,421
Iowa	1880	28	64,250	183	64,406	172	.....	11	32,642	139,195
	1890	29	311,921	279	119,613	275	4	.....	49,962	237,275
Kansas	1880	5	8,150	20	3,200	19	1	.....	1,561	8,780
	1890	6	21,275	36	11,390	33	.....	3	4,696	23,117
Kentucky	1880	15	44,100	81	22,110	72	.....	9	20,650	66,350
	1890	10	250,643	201	97,886	184	17	.....	48,498	194,578
Louisiana	1880	2	2,000	7	2,950	7	.....	.....	3,100	10,500
	1890	5	41,550	51	23,767	51	.....	.....	9,431	45,370
Maine	1880	7	37,100	28	14,300	28	.....	.....	11,661	38,950
	1890	9	382,852	172	82,767	171	1	.....	87,935	292,314
Maryland	1880	17	142,950	286	120,234	213	10	63	80,273	271,944
	1890	11	497,507	623	263,797	533	69	21	116,560	504,225
Massachusetts	1880	24	262,300	253	113,050	234	13	6	71,025	297,394
	1890	29	811,541	510	274,987	454	49	7	114,355	505,354
Michigan	1880	8	26,500	34	12,900	34	.....	.....	6,678	30,950
	1890	11	364,446	208	96,620	201	.....	7	55,362	228,352
Minnesota	1880	5	43,000	31	14,962	31	.....	.....	12,825	41,700
	1890	9	243,075	181	89,921	175	2	4	57,512	214,600
Mississippi	1880	2	4,700	28	8,800	28	.....	.....	2,810	19,500
	1890	3	50,140	46	24,980	41	.....	5	11,457	44,000
Missouri	1880	36	282,300	269	101,700	255	1	13	152,010	372,803
	1890	45	1,408,592	1,093	553,904	1,074	3	16	318,781	1,278,713
Nebraska	1880	1	4,500	13	2,724	13	.....	.....	1,000	4,815
	b1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire	1880	7	65,500	71	29,983	65	2	4	16,434	68,500
	1890	4	61,350	36	19,022	28	8	.....	11,872	45,300
New Jersey	1880	49	2,057,200	3,180	1,101,511	2,054	458	668	1,030,598	2,598,757
	1890	60	5,478,332	4,628	2,596,699	3,636	808	184	1,366,834	5,165,537
New York	1880	65	808,700	895	344,739	714	142	39	299,293	913,560
	1890	56	2,785,120	1,756	901,160	1,484	260	12	537,573	2,122,744
North Carolina	1880	2	1,600	2	100	2	.....	.....	600	1,650
	1890	9	3,146	34	6,721	34	.....	.....	2,350	13,120
Ohio	1880	185	1,814,555	2,816	946,552	2,169	226	421	657,973	2,279,474
	1890	125	5,927,139	4,873	2,312,510	4,119	619	135	1,313,230	5,047,501
Pennsylvania	1880	103	771,545	888	282,232	710	85	93	233,361	748,169
	1890	67	2,689,211	1,671	745,795	1,528	105	38	390,164	1,739,953
Rhode Island	1880	2	8,500	12	4,700	12	.....	.....	3,900	23,000
	b1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina	1880	3	6,500	18	2,200	18	.....	.....	8,500	16,200
	1890	5	11,975	34	10,165	33	.....	1	2,665	14,291

a None reported in 1880.

b See note a at end of table.

TABLE 2.—COMPARATIVE STATEMENT, CLAY AND POTTERY PRODUCTS, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments reporting	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
Tennessee	1880	8	$16,900	29	$5,294	24	2	3	$2,115	$12,260
	1890	10	45,884	74	20,400	59	.....	15	7,085	23,030
Texas	1880	8	14,100	25	8,430	25	.....	.....	6,750	26,270
	1890	19	85,147	133	53,610	131	1	1	18,011	96,580
Utah	1880	2	4,000	5	1,800	5	.....	.....	800	5,000
	a1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vermont	1880	3	65,000	28	13,700	28	.....	.....	14,000	41,000
	1890	4	53,340	29	13,502	28	1	.....	7,527	29,048
Virginia	1880	15	16,850	32	6,155	29	.....	3	6,515	26,597
	1890	10	13,170	39	7,919	35	.....	4	2,949	17,840
Washington	1880	1	1,000	2	500	2	.....	.....	500	1,500
	1890	4	152,193	84	50,405	83	1	.....	19,626	139,829
West Virginia	1880	6	25,100	58	16,111	56	2	.....	9,208	32,700
	1890	8	86,682	68	27,828	60	2	6	12,640	55,372
Wisconsin	1880	15	95,900	98	26,387	94	.....	4	32,576	100,395
	1890	16	185,340	150	68,820	148	2	.....	35,771	142,977
All other states	a1890	8	268,225	154	85,503	142	4	8	39,786	192,300

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Delaware 2; Florida, 1; Nebraska, 1; Oregon, 1; Rhode Island, 2; Utah, 1.

TABLE 3.—DETAILED STATEMENT, CLAY AND POTTERY

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.							
			Aggregate.	Value of plant.				Live assets.		
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	707	$26,127,104	$15,606,955	$3,976,737	$6,709,949	$4,920,269	$10,520,149	$964,768	$4,843,908	$4,711,473
2	Alabama	11	37,208	32,330	22,850	4,375	5,105	4,878	385	2,365	2,128
3	Arkansas	9	22,234	16,023	3,978	8,850	3,195	6,211	1,005	3,340	1,866
4	California	12	1,048,682	747,220	130,400	314,050	302,770	301,462	19,635	142,984	138,843
5	Colorado	6	232,640	122,736	47,883	33,121	41,732	109,904	10,825	52,150	46,929
6	Connecticut	15	212,445	107,250	19,100	47,000	41,150	105,195	8,160	54,050	42,985
7	District of Columbia	5	173,702	110,646	33,625	30,253	46,768	63,056	1,150	24,500	37,406
8	Georgia	17	229,269	168,350	33,290	48,985	86,075	60,919	3,139	24,260	33,520
9	Illinois	40	1,675,108	997,377	154,140	353,537	399,700	767,731	62,383	322,591	382,757
10	Indiana	20	266,020	147,150	38,950	73,500	34,700	118,870	11,395	46,150	61,325
11	Iowa	29	311,921	221,860	77,025	80,200	64,635	90,061	8,274	48,506	33,281
12	Kansas	6	21,275	16,180	2,900	8,450	4,830	5,095	730	2,790	1,575
13	Kentucky	10	250,643	162,911	32,560	39,900	90,451	87,732	11,336	29,932	46,464
14	Louisiana	5	41,550	31,800	10,000	7,500	14,300	9,750	1,050	6,000	2,700
15	Maine	9	382,852	163,600	62,500	48,600	52,500	219,252	42,920	102,972	73,360
16	Maryland	11	497,507	287,000	101,800	82,750	102,450	210,507	19,490	83,858	107,159
17	Massachusetts	29	811,541	414,740	68,200	177,800	168,740	396,801	54,323	191,575	150,903
18	Michigan	11	364,446	184,425	35,950	45,150	103,325	180,021	6,745	88,626	84,650
19	Minnesota	9	243,075	141,400	54,600	40,900	45,900	101,675	6,225	55,550	39,900
20	Mississippi	3	50,140	33,380	10,850	12,000	10,530	16,760	260	10,700	5,800
21	Missouri	45	1,408,592	871,135	247,770	307,457	315,908	537,457	24,701	239,319	273,437
22	New Hampshire	4	61,350	25,750	4,500	10,700	10,550	35,600	2,200	20,550	12,850
23	New Jersey	60	5,478,332	3,128,183	766,533	1,525,553	836,097	2,350,149	256,949	1,123,910	969,290
24	New York	56	2,785,120	1,600,920	441,350	727,800	431,770	1,184,200	146,492	567,498	470,210
25	North Carolina	9	3,146	2,080	430	1,060	590	1,066	95	876	95
26	Ohio	125	5,927,139	3,673,765	865,677	1,720,110	1,087,978	2,253,374	144,098	965,507	1,143,769
27	Pennsylvania	67	2,689,211	1,671,374	455,411	753,066	462,897	1,017,837	80,175	497,623	440,039
28	South Carolina	5	11,975	9,780	5,600	3,200	980	2,195	360	1,525	310
29	Tennessee	10	45,884	29,523	5,180	8,840	15,503	16,361	1,835	9,210	5,316
30	Texas	19	85,147	68,807	21,627	29,125	18,055	16,346	2,845	11,020	2,475
31	Vermont	4	53,340	38,000	13,750	18,700	5,550	15,340	1,100	8,600	5,640
32	Virginia	10	13,170	7,075	1,950	3,200	1,925	6,095	560	4,335	1,200
33	Washington	4	152,193	116,923	52,160	46,114	18,649	35,270	3,750	22,050	9,470
34	West Virginia	8	86,682	62,205	38,200	15,700	8,305	24,477	575	15,409	8,493
35	Wisconsin	16	185,340	94,952	31,798	26,503	36,651	90,388	5,803	26,577	58,008
36	All other states (a)	8	268,225	190,105	84,200	55,900	50,005	78,120	23,800	37,000	17,320

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Delaware, 2; Florida, 1; Nebraska, 1; Oregon, 1; Rhode Island, 2; Utah, 1.

PRODUCTS, BY STATES AND TERRITORIES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.						
							Aggregates.		Officers, firm members, and clerks.				
									Males above 16 years.		Females above 15 years.		
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	
$2,003,007	$92,156	$127,962	$114,231	$393,724	$188,051	$1,086,883	20,296	$10,138,143	1,268	$1,247,513	48	$21,598	1
833	100	70	97	194	215	157	62	15,387	6	2,693	.....	.....	2
1,585	120	133	55	695	125	457	76	22,333	10	4,848	.....	.....	3
153,469	3,600	3,865	5,896	12,656	4,785	122,667	393	260,497	31	40,000	.....	.....	4
10,215	3,080	1,064	435	3,748	1,168	800	121	87,249	15	24,960	.....	.....	5
29,315	1,690	682	1,038	3,645	1,530	20,730	257	143,256	28	31,610	.....	.....	6
6,303	150	363	359	2,551	480	2,400	89	40,621	1	900	.....	.....	7
5,739	720	997	905	875	958	1,284	264	90,011	31	20,540	.....	.....	8
143,204	13,670	5,936	8,395	34,493	9,758	70,952	1,512	753,934	67	64,221	2	916	9
18,598	950	2,429	2,089	5,440	1,950	5,740	359	165,164	32	30,787	.....	.....	10
24,123	340	1,054	1,196	11,757	2,132	7,644	279	119,613	34	23,202	.....	.....	11
1,390	380	139	138	350	8	380	36	11,390	6	3,294	.....	.....	12
13,528	780	1,049	703	4,370	578	6,048	201	97,886	19	16,162	2	615	13
2,405	120	.....	635	625	.....	1,025	51	23,767	8	5,844	.....	.....	14
26,727	602	1,650	1,445	6,340	1,500	15,190	172	82,767	14	12,529	1	300	15
9,079	870	2,446	1,983	1,550	270	1,960	623	263,797	17	17,014	1	210	16
42,489	6,750	7,560	5,392	6,062	5,470	11,255	510	274,987	43	43,540	3	1,540	17
22,374	1,150	1,859	1,097	4,260	4,200	9,808	208	96,620	18	20,270	.....	.....	18
21,566	3,700	845	636	3,240	3,990	9,155	181	89,921	16	12,200	.....	.....	19
511	.....	16	335	.....	.....	160	46	24,980	8	7,000	.....	.....	20
165,671	14,480	6,749	6,884	34,838	8,856	93,864	1,093	553,904	80	90,663	2	1,305	21
5,972	.....	337	260	165	.....	5,210	36	19,022	5	2,624	.....	.....	22
467,998	3,150	29,073	21,712	66,849	69,624	277,590	4,628	2,596,699	194	237,922	9	4,394	23
167,503	21,500	15,018	12,131	27,016	17,722	74,116	1,756	901,160	114	114,246	9	3,802	24
57	.....	14	.....	35	.....	8	34	6,721	7	2,899	.....	.....	25
459,333	4,605	31,024	26,822	115,143	34,499	247,240	4,873	2,312,510	254	250,902	13	5,906	26
156,104	6,444	9,698	10,727	30,644	12,704	85,887	1,671	745,795	120	103,785	2	1,050	27
319	.....	98	36	185	.....	.....	34	10,165	5	2,940	.....	.....	28
1,582	.....	209	175	412	606	180	74	20,400	7	4,476	.....	.....	29
2,854	.....	539	165	1,025	100	1,025	133	53,610	16	10,243	1	140	30
2,853	.....	390	329	138	336	1,660	29	13,502	3	1,350	1	400	31
904	430	49	.....	165	.....	260	39	7,919	8	2,694	.....	.....	32
5,317	.....	607	305	1,600	2,700	105	84	50,405	10	9,300	.....	.....	33
2,759	273	358	373	525	200	1,030	68	27,828	7	4,804	.....	.....	34
12,634	1,882	1,036	595	1,723	1,107	6,291	150	68,820	19	14,444	.....	.....	35
17,694	700	606	893	10,410	480	4,605	154	85,503	15	12,607	2	1,020	36

TABLE 3.—DETAILED STATEMENT, CLAY AND POTTERY

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.											
		Operatives, skilled and unskilled.						Pieceworkers.					
		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.	
		Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States...	13,950	$6,808,408	1,532	$346,288	405	$59,982	2,452	$1,471,156	491	$152,554	150	$30,644
2	Alabama	40	10,880			11	618	5	1,196				
3	Arkansas	42	13,625	2	470	16	1,760	4	1,474			2	156
4	California	355	215,777					7	4,720				
5	Colorado	99	60,089			6	1,300	1	900				
6	Connecticut	172	84,016	17	4,510	8	1,636	32	21,484				
7	District of Columbia	86	38,521					2	1,200				
8	Georgia	217	64,059	4	504	2	40	10	4,868				
9	Illinois	1,275	623,545	35	5,720	43	5,853	90	53,679				
10	Indiana	245	110,994	41	8,058			27	13,141	14	2,184		
11	Iowa	218	84,173					23	10,238	4	2,000		
12	Kansas	20	5,844			3	192	7	2,060				
13	Kentucky	142	61,277	15	2,270			23	17,562				
14	Louisiana	42	17,347					1	576				
15	Maine	151	65,538					6	4,400				
16	Maryland	491	214,437	65	15,000	20	2,130	25	14,156	3	846	1	104
17	Massachusetts	364	193,007	43	10,985	7	950	47	24,250	3	715		
18	Michigan	172	69,376			7	1,124	11	5,850				
19	Minnesota	123	56,509	2	480	4	600	36	20,132				
20	Mississippi	32	16,600			5	600	1	780				
21	Missouri	954	436,321	1	200	15	3,519	40	21,740			1	156
22	New Hampshire	17	8,622	8	3,276			6	4,500				
23	New Jersey	2,731	1,619,255	579	131,606	96	16,398	711	505,740	220	66,984	88	14,400
24	New York	1,223	626,916	176	42,116	12	1,496	147	83,401	75	29,183		
25	North Carolina	23	3,422					4	400				
26	Ohio	2,835	1,301,373	436	98,319	78	13,756	1,030	576,334	170	50,142	57	15,778
27	Pennsylvania	1,337	585,376	103	20,836	37	3,704	71	30,994			1	50
28	South Carolina	27	6,750			1	75	1	400				
29	Tennessee	48	11,624			15	1,700	4	2,600				
30	Texas	85	25,687			1	142	30	17,398				
31	Vermont	18	7,512					7	4,240				
32	Virginia	21	3,900			4	225	6	1,100				
33	Washington	73	40,745	1	360								
34	West Virginia	43	16,147			6	664	10	5,713	2	500		
35	Wisconsin	109	44,338	2	828			20	9,210				
36	All other states	120	64,906	2	750	8	1,500	7	4,720				

PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

MATERIALS USED.															
	Clay.														
Aggregate cost.	Total.		China clay.				Ball clay.				Sagger clay.		All other clay and cement.		
			Domestic.		Foreign.		Domestic.		Foreign.						
	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	
$5,618,401	1,206,878	$2,083,421	27,632	$305,755	4,096	$58,188	41,477	$137,724	3,338	$40,570	25,508	$79,458	1,104,827	$1,461,726	1
3,803	971	954	6	25	.....	.....	770	576	.....	.....	.....	.....	195	353	2
7,438	8,303	2,740	.....	.....	.....	.....	350	350	.....	.....	.....	.....	7,953	2,390	3
276,121	42,320	94,839	.....	.....	.....	.....	3,700	1,450	.....	.....	.....	.....	38,620	93,389	4
88,167	26,875	63,580	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26,875	63,580	5
47,593	2,939	22,749	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,939	22,749	6
29,880	23,220	12,700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23,220	12,700	7
31,177	4,642	11,066	.....	.....	.....	.....	125	179	.....	.....	.....	.....	4,517	10,887	8
426,134	108,526	206,721	3,140	18,800	400	5,000	4,593	8,327	.....	.....	5	10	100,388	174,584	9
65,456	5,517	15,731	186	2,117	12	150	390	1,666	1	15	688	2,003	4,240	9,780	10
49,962	13,444	17,332	.....	.....	90	1,800	412	701	.....	.....	.....	.....	12,942	14,831	11
4,696	862	1,799	.....	.....	.....	.....	360	720	.....	.....	.....	.....	502	1,079	12
48,498	11,502	26,493	600	1,200	.....	.....	252	602	.....	.....	.....	.....	10,650	24,691	13
9,431	2,450	4,650	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,450	4,650	14
87,935	21,240	53,095	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21,240	53,095	15
116,560	77,359	57,634	880	7,080	75	945	660	3,075	67	891	440	1,120	75,237	44,613	16
114,355	24,007	40,845	665	3,440	15	300	201	1,899	6	91	135	657	22,985	34,458	17
55,362	15,751	13,080	.....	.....	.....	.....	66	200	.....	.....	.....	.....	15,685	12,880	18
57,512	21,747	31,786	.....	.....	.....	.....	32	136	.....	.....	.....	.....	21,715	31,650	19
11,457	2,600	4,250	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,600	4,250	20
318,781	155,502	130,528	369	797	.....	.....	611	685	.....	.....	259	477	154,263	128,569	21
11,872	680	3,511	20	300	30	600	20	120	30	450	20	120	560	1,921	22
1,366,834	78,241	338,998	10,520	129,864	1,260	16,300	8,030	47,049	962	10,501	12,845	26,841	44,624	108,443	23
537,573	108,309	234,016	1,631	10,384	1,353	19,640	904	4,886	.....	.....	1,637	8,709	102,784	190,397	24
2,350	1,814	865	.....	.....	.....	.....	1,724	355	.....	.....	.....	.....	90	510	25
1,313,230	313,140	420,806	8,984	123,593	771	12,072	6,795	32,447	2,243	28,212	5,964	28,864	288,383	195,612	26
390,164	102,048	201,691	631	8,155	90	1,375	8,400	26,718	29	500	3,515	10,657	89,383	154,286	27
2,665	1,150	1,450	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,150	1,450	28
7,085	2,145	3,216	.....	.....	.....	.....	1,530	2,295	.....	.....	.....	.....	615	921	29
18,011	2,634	5,847	.....	.....	.....	.....	1,092	2,260	.....	.....	.....	.....	1,542	3,587	30
7,527	600	3,638	.....	.....	.....	.....	150	788	.....	.....	.....	.....	450	2,850	31
2,949	530	727	.....	.....	.....	.....	100	100	.....	.....	.....	.....	430	627	32
19,628	550	5,712	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	550	5,712	33
12,640	4,200	6,325	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,200	6,325	34
35,771	10,853	22,104	.....	.....	.....	.....	100	75	.....	.....	.....	.....	10,753	22,029	35
39,786	10,207	21,943	.....	.....	.....	.....	110	65	.....	.....	.....	.....	10,097	21,878	36

TABLE 3.—DETAILED STATEMENT, CLAY AND POTTERY

	STATES AND TERRITORIES.	MATERIALS USED—continued.									
		Fuel.						Packing materials.			
		Total cost.	Coal.		Wood.		All other fuel. (Cost.)	Total cost.	Straw, etc. (Cost.)	Crates and hogsheads. (Cost.)	Barrels and boxes. (Cost.)
			Tons.	Cost.	Cords.	Cost.					
1	The United States	$1,799,146	604,859	$1,404,256	95,811	$250,244	$144,646	$334,775	$78,125	$209,485	$47,165
2	Alabama	2,593	180	305	1,330	2,288					
3	Arkansas	3,962			2,135	3,962					
4	California	159,327	12,264	101,144	14,440	58,183		240	20	100	120
5	Colorado	6,810	1,998	6,606	40	204					
6	Connecticut	10,814	2,140	9,649	209	955	210	4,480	1,700	2,430	350
7	District of Columbia	13,251	4,712	12,201	350	1,050		50	30		20
8	Georgia	17,431	6,225	15,214	1,641	2,217		1,140		1,000	140
9	Illinois	160,145	77,679	143,204	6,085	16,836	105	1,765	748	681	336
10	Indiana	28,511	4,815	11,350	2,445	5,361	11,800	3,223	144	2,579	500
11	Iowa	29,877	11,098	23,339	2,433	5,213	1,325	42	32	5	5
12	Kansas	2,289	415	1,469	273	595	225	12	12		
13	Kentucky	15,075	7,530	13,410	1,000	1,665		201	17	115	69
14	Louisiana	2,368			909	2,256	112				
15	Maine	31,754	8,884	28,684	1,420	3,045	25				
16	Maryland	28,274	8,385	25,275	743	2,999		4,329	744	3,100	485
17	Massachusetts	38,365	6,262	28,439	2,365	9,926		2,890	800	1,450	640
18	Michigan	36,991	13,548	34,205	1,180	2,156	630	860	100	690	70
19	Minnesota	19,429	3,545	10,915	5,583	8,414	100				
20	Mississippi	6,700	2,000	2,700	1,900	4,000					
21	Missouri	152,066	92,890	139,341	7,287	12,725		74	51	12	11
22	New Hampshire	3,392	422	2,482	320	810	100	1,270	120	150	1,000
23	New Jersey	319,823	79,458	306,118	3,522	13,705		177,702	43,027	109,146	25,529
24	New York	153,403	37,294	137,931	5,760	15,132	340	7,342	872	6,122	348
25	North Carolina	1,445			1,490	1,445		20	12	5	3
26	Ohio	372,994	185,442	255,233	6,397	10,756	107,005	110,729	24,795	70,384	15,550
27	Pennsylvania	121,793	29,772	73,304	6,633	26,219	22,270	17,487	4,667	10,886	1,934
28	South Carolina	930			925	930					
29	Tennessee	3,726	1,040	1,920	1,517	1,806		118	48	70	
30	Texas	10,583			5,414	10,583		21	6		15
31	Vermont	2,380	20	120	515	2,260		720	160	560	
32	Virginia	1,663	10	19	1,134	1,344	300	30			30
33	Washington	12,505			4,201	12,505					
34	West Virginia	5,846	2,595	5,568	160	278					
35	Wisconsin	6,135	1,405	4,337	593	1,699	99				
36	All other states	16,496	2,831	9,774	3,462	6,722		30	20		10

PRODUCTS, BY STATES AND TERRITORIES: 1890--Continued.

MATERIALS USED—continued.																	
Miscellaneous.																	
Total cost.	Oxide of zinc.		Oxide of lead.		Oxide of cobalt.		Borax.		Boracic acid.		Flint.		Feldspar.		Plaster.		
	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	
$1,401,059	216,670	$13,669	1,172,235	$84,917	33,447	$80,860	65,885	$6,290	355,916	$41,089	33,310	$200,462	20,514	$172,495	4,054	$38,661	1
256															1	19	2
736																	3
21,715			100	8											500	1,650	4
17,777							44,022	4,000									5
9,550			25,000	2,000	480	1,200			416	50	177	945			21	279	6
3,879															7	87	7
1,540			1,000	75							4	30	4	100	9	187	8
57,503	480	35	4,950	480	70	180	100	4	1,700	170	152	1,215	807	6,080	25	316	9
17,991	1,200	72	600	48	300	780	10,731	1,071	475	76	239	2,158	50	656	1,212	2,040	10
2,711			2,440	124											6	93	11
596			350	28													12
6,729			9,000	540							75	825			3	47	13
2,413																	14
3,086																	15
26,323	13,500	687	43,700	2,740	675	1,545	800	10	6,900	763	475	3,930	300	3,122	80	823	16
32,255	4,750	362	27,840	1,080	270	687			225	27	1,225	4,634	112	1,620	25	392	17
4,431															6	90	18
6,297			200	25			20	5							12	30	19
507																	20
36,113	10	4	5,716	238	7	13	10	1							7	111	21
3,699	10	6	6,000	450	250	565			300	45	30	450	15	225	3	36	22
530,311	108,670	7,361	354,143	32,119	14,395	35,961	2,450	323	157,158	17,395	19,114	140,513	14,379	104,385	946	14,664	23
142,812	4,800	330	40,900	2,771	515	1,150	1,210	106	4,000	480	2,379	20,161	740	9,196	307	4,530	24
20											1	15					25
408,701	78,790	4,469	532,036	36,139	15,971	38,150	6,217	736	181,192	21,728	8,864	80,861	3,855	44,829	755	11,288	26
49,193	4,460	343	62,460	4,995	500	625	325	34	3,550	355	545	4,425	251	2,267	128	1,959	27
285																	28
25																	29
1,560											30	300					30
789																	31
529			3,300	246									1	15			32
1,409																	33
469					14	4											34
7,532			500	35											1	20	35
1,317			2,000	170													36

TABLE 3.—DETAILED STATEMENT, CLAY AND POTTERY

	STATES AND TERRITORIES.	MATERIALS USED—continued.												
		Miscellaneous—Continued.												
		Whiting.		Salt.		Liquid and coin gold. (Cost.)	Color. (Cost.)	Copper and steel plates. (Cost.)	Sand.		Albany dip. (Cost.)	Mill supplies. (Cost.)	Rent paid for power and heat. (Cost.)	All other materials. (Cost.)
		Pounds.	Cost.	Tons.	Cost.				Tons.	Cost.				
1	The United States	1,293,365	$16,026	3,098	$16,417	$96,480	$51,229	$14,222	67,107	$64,858	$13,532	$67,460	$3,300	$359,092
2	Alabama	12,000	120				55				25			37
3	Arkansas			5	64				2	1	497	30		144
4	California			317	2,170				3,200	3,200	362	8,000		6,325
5	Colorado			3	54				10,300	5,300		23		8,400
6	Connecticut			6	205		500		1,605	1,231	65	125	450	2,500
7	District of Columbia			72	502				5,240	2,020		620		650
8	Georgia	9,560	117	30	240				580	176	26	2		587
9	Illinois	4,200	312	242	1,597	1,000	802		2,657	2,784	1,214	16,953		24,361
10	Indiana	6,970	57	15	77			1	61	82	511	125		10,237
11	Iowa			14	67		21		514	347	766	30		1,263
12	Kansas			3	18		5		133	173	220			152
13	Kentucky	300	3	2	15		150		1,507	1,840	150	300		2,859
14	Louisiana			2	20				150	335	30	25		2,003
15	Maine			23	68				885	1,855	73		90	1,000
16	Maryland	12,500	197	6	26	7,387	1,100	950	305	335	110	550		2,018
17	Massachusetts	6,750	75	4	166		1,080	4,450	3,840	2,827	3,543	900	1,000	8,806
18	Michigan			30	90				3,300	3,044			120	1,067
19	Minnesota			80	480	10	20		5,230	2,640	490			2,397
20	Mississippi										250	107		150
21	Missouri	20	30	569	2,530		60		1,691	2,195	1,082	1,086	500	28,263
22	New Hampshire	600	12			1,000	175	500	210	210				25
23	New Jersey	884,626	10,772	127	455	54,793	25,843	3,303	1,665	1,484	967	9,351	600	70,022
24	New York	8,900	120	156	884	1,600	800	300	7,776	14,108	485	1,743	260	83,788
25	North Carolina													5
26	Ohio	302,939	3,336	1,069	5,040	29,910	19,602	4,716	5,060	7,195	845	24,689		75,168
27	Pennsylvania	44,000	875	236	774	770	907		3,179	2,475	749	2,726	240	24,674
28	South Carolina								160	160		25		100
29	Tennessee													25
30	Texas			6	52				610	610	343			255
31	Vermont								200	175				614
32	Virginia			4	80		100				53			35
33	Washington								1,200	1,300				109
34	West Virginia					10	9	2			60		40	344
35	Wisconsin			6	98				5,821	6,743	130	50		456
36	All other states			71	645				26	13	486			3

a Includes sanitary or plumbers' earthenware to the value of $1,214,400 in the state of New Jersey.

PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

VALUE OF PRODUCTS.												
	Porcelain and earthenware.							China and fancy ware.				
Aggregate.	Total.	Stone porcelain.	White granite.	C. C or cream colored.	Rockingham.	Yellow.	All other earthenware. (a)	Total.	China (both hard and soft biscuit) vitrified and vitreous.	Decorated ware.	Art pottery and porcelain and ornamental tiling.	
$22,057,090	$6,183,152	$669,107	$1,676,579	$1,226,161	$207,751	$231,802	$2,171,752	$3,542,831	$460,334	$2,125,329	$957,168	1
23,381	3,998	281	.....	.....	.....	1,576	2,141	2,116	.....	172	1,944	2
35,849	1,144	.....	.....	.....	.....	.....	1,144	.....	.....	.....	.....	3
895,260	9,600	.....	.....	.....	.....	.....	9,600	200	.....	.....	200	4
215,542	4,500	.....	.....	.....	.....	.....	4,500	.....	.....	.....	.....	5
267,840	61,200	.....	.....	45,000	.....	.....	16,200	80,000	.....	80,000	.....	6
114,637	9,000	.....	.....	.....	.....	.....	9,000	.....	.....	.....	.....	7
211,250	16,270	14,000	.....	.....	868	1,000	402	4,000	.....	.....	4,000	8
1,556,590	34,105	18,320	.....	.....	.....	.....	15,785	156,000	.....	156,000	.....	9
313,421	17,020	.....	.....	5,000	.....	500	11,520	1,600	1,000	600	.....	10
237,275	13,100	10,000	.....	.....	.....	.....	3,100	1,200	.....	1,200	.....	11
23,117	10,915	10,625	.....	.....	.....	.....	290	.....	.....	.....	.....	12
194,578	48,400	16,900	.....	.....	12,700	14,500	4,300	.....	.....	.....	.....	13
45,370	32,570	.....	.....	.....	.....	.....	32,570	.....	.....	.....	.....	14
292,314	6,300	.....	.....	.....	.....	.....	6,300	.....	.....	.....	.....	15
504,225	170,508	2,400	40,500	111,000	4,000	4,080	8,528	115,800	300	115,250	250	16
505,354	186,200	30,000	.....	23,500	.....	.....	132,700	63,500	.....	28,500	35,000	17
228,352	31,700	.....	.....	.....	.....	.....	31,700	.....	.....	.....	.....	18
214,600	16,250	250	.....	.....	.....	.....	16,000	5,300	.....	.....	5,300	19
44,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20
1,278,713	27,676	1,600	.....	.....	.....	3,946	22,130	3,000	.....	1,000	2,000	21
45,300	3,000	.....	.....	.....	.....	.....	3,000	35,000	.....	.....	35,000	22
5,165,537	2,662,314	376,021	526,311	418,733	23,600	72,000	1,245,649	1,859,754	425,683	1,070,245	363,826	23
2,122,744	231,942	1,650	43,568	15,729	.....	.....	170,995	168,751	33,351	20,400	115,000	24
13,120	3,520	2,780	.....	.....	.....	.....	740	.....	.....	.....	.....	25
5,047,501	2,071,291	105,280	1,002,843	571,399	156,547	118,752	116,470	899,472	.....	564,824	334,648	26
1,739,953	416,671	79,000	63,357	35,800	10,036	9,600	218,878	144,577	.....	84,577	60,000	27
14,291	9,800	.....	.....	.....	.....	.....	9,800	.....	.....	.....	.....	28
33,030	13,400	.....	.....	.....	.....	.....	13,400	.....	.....	.....	.....	29
96,580	34,810	.....	.....	.....	.....	.....	34,810	.....	.....	.....	.....	30
29,048	1,248	.....	.....	.....	.....	1,248	.....	.....	.....	.....	.....	31
17,840	1,900	.....	.....	.....	.....	.....	1,900	.....	.....	.....	.....	32
139,829	2,850	.....	.....	.....	.....	.....	2,850	.....	.....	.....	.....	33
55,372	7,300	.....	.....	.....	.....	.....	7,300	.....	.....	.....	.....	34
142,977	13,150	.....	.....	.....	.....	.....	13,150	2,561	.....	2,561	.....	35
192,300	9,500	.....	.....	.....	.....	4,600	4,900	.....	.....	.....	.....	36

TABLE 8.—DETAILED STATEMENT, CLAY AND POTTERY

	STATES AND TERRITORIES.	VALUE OF PRODUCTS—continued.								
		Terra cotta.								
		Total.	Chimney tops.	Chimney flues.	Lumber.	Brick.		Hollow brick and fire proofing.	Electric conduits.	Architectural and ornamental work.
						Number of 1,000.	Value.			
1	The United States	$2,244,790	$101,208	$68,184	$204,700	11,631	$187,920	$198,050	$53,500	$1,431,228
2	Alabama									
3	Arkansas									
4	California	157,900	6,100	6,800		300	10,500			134,500
5	Colorada									
6	Connecticut	2,700	2,000			35	500			200
7	District of Columbia	20,882				126	882		20,000	
8	Georgia	40,000								40,000
9	Illinois	443,600	3,600			278	5,000	60,000		375,000
10	Indiana	120,000			60,000	1,000	5,000			55,000
11	Iowa	15,780	200		4,700	1,530	10,830			50
12	Kansas	210				30	210			
13	Kentucky	10,000	2,500	7,500						
14	Louisiana									
15	Maine	25,100				600	25,000			100
16	Maryland	153,000	3,000			100	20,000			130,000
17	Massachusetts	40,000			40,000					
18	Michigan	5,612	5,112	500						
19	Minnesota	54,000				1,800	36,000	18,000		
20	Mississippi									
21	Missouri	175,417	14,200	46,384		30	6,840			107,993
22	New Hampshire									
23	New Jersey	88,302	21,177			3,500	40,875			26,250
24	New York	539,187	542		100,000	1,300	13,000	45,000		380,645
25	North Carolina									
26	Ohio	157,424	27,987			958	12,447	29,800	33,500	53,690
27	Pennsylvania	179,610	8,910			40	800	45,250		124,650
28	South Carolina	36				4	36			
29	Tennessee									
30	Texas	4,900	1,750							3,150
31	Vermont									
32	Virginia									
33	Washington	10,660	3,660	7,000						
34	West Virginia									
35	Wisconsin	120	120							
36	All other states	350	350							

a Includes items as follows: porcelain doorknobs, $100,524: New York, $97,524; Ohio, $3,000. Mineral doorknobs, Ohio, $23,000. Electric insulators and trimmings, $52,348: New York, $27,348; Ohio, $25,000. Hardware trimmings, $90,635: Massachusetts, $3,201; New Jersey, $14,500; New York, $72,934.

PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

VALUE OF PRODUCTS—continued.														
Fire clay.							Stoneware.							
Total.	Gas retorts.	Glass retorts.	Fire brick.		Furnace fittings.	Stove linings and similar products.	Total.	Stoneware.	Stone fancy goods.	Porcelain and special ware. (a)	Tile.	Sewer pipe.	Saggers' pins, stilts, spars, and ground spar and flint.	All other products not elsewhere specified.	
			Number of 1,000.	Value.											
$1,315,449	$24,408	$312,343	28,145	$666,206	$161,469	$151,023	$2,056,463	$1,999,463	$57,000	$266,507	$795,958	$5,107,212	$290,339	$254,389	1
100	.....	.....	5	100	.....	.....	17,167	16,667	500	.....	.....	.....	.....	.....	2
340	.....	.....	18	340	.....	.....	33,125	33,125	.....	.....	1,200	40	.....	.....	3
63,750	.....	.....	2,495	63,750	.....	.....	2,460	2,460	.....	.....	.....	643,350	.....	18,000	4
127,490	.....	.....	915	20,100	107,390	.....	15,787	15,787	.....	.....	.....	62,765	.....	5,000	5
.....	.....	.....	.....	.....	.....	.....	25,500	25,200	300	.....	.....	70,540	.....	27,900	6
91	.....	.....	7	91	.....	.....	•3,500	3,500	.....	.....	.....	80,164	.....	1,000	7
25,500	.....	.....	2,000	25,500	.....	.....	21,800	21,800	.....	.....	.....	103,630	.....	50	8
62,278	1,008	.....	2,313	39,925	.....	21,345	224,886	224,886	.....	.....	310,020	318,580	.....	7,121	9
.....	.....	.....	.....	.....	.....	.....	49,850	49,800	50	.....	114,951	10,000	.....	.....	10
2,300	.....	.....	110	2,300	.....	.....	132,134	132,134	.....	.....	1,051	62,545	.....	9,165	11
2,980	.....	.....	190	2,980	.....	.....	8,690	8,540	150	.....	322	.....	.....	.....	12
.....	.....	.....	.....	.....	.....	.....	21,400	19,100	2,300	.....	58,778	55,000	.....	1,000	13
12,800	.....	.....	.....	.....	12,800	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
75,000	.....	.....	500	75,000	.....	.....	44,000	41,500	2,500	.....	3,000	138,914	.....	.....	15
9,100	.....	.....	70	2,100	.....	7,000	12,167	12,167	.....	.....	14,000	29,500	.....	150	16
42,953	.....	.....	395	19,075	.....	23,878	67,500	67,000	500	3,201	2,000	52,000	14,000	34,000	17
3,200	.....	.....	230	3,200	.....	.....	.....	.....	.....	.....	65,000	122,840	.....	.....	18
.....	.....	.....	.....	.....	.....	.....	110,000	100,000	10,000	.....	.....	28,800	.....	250	19
.....	.....	.....	.....	.....	.....	.....	44,000	44,000	.....	.....	.....	.....	.....	.....	20
266,227	12,000	28,576	9,643	191,572	34,079	.....	149,713	149,713	.....	.....	123,660	533,000	.....	20	21
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,300	.....	.....	22
25,480	.....	.....	1,000	25,480	.....	.....	22,289	17,289	5,000	14,500	5,655	176,693	235,044	75,506	23
212,755	11,400	17,450	1,173	93,405	.....	90,500	185,293	185,293	.....	197,806	26,745	549,265	5,000	6,000	24
.....	.....	.....	.....	.....	.....	.....	9,600	9,600	.....	.....	.....	.....	.....	.....	25
117,488	.....	78,750	5,241	38,738	.....	.....	487,391	458,591	28,800	51,000	13,700	1,199,100	36,295	14,340	26
250,517	.....	187,567	1,430	55,250	7,200	500	200,950	200,950	.....	.....	20,650	485,467	.....	41,571	27
1,600	.....	.....	100	1,600	.....	.....	1,875	1,875	.....	.....	.....	980	.....	.....	28
3,400	.....	.....	250	2,600	.....	800	15,780	15,780	.....	.....	150	.....	.....	800	29
7,500	.....	.....	50	2,500	.....	5,000	45,720	45,620	100	.....	500	1,800	.....	1,350	30
.....	.....	.....	.....	.....	.....	.....	22,500	22,500	.....	.....	.....	5,300	.....	.....	31
.....	.....	.....	.....	.....	.....	.....	14,240	10,240	4,000	.....	1,300	.....	.....	400	32
600	.....	.....	10	600	.....	.....	720	720	.....	.....	17,976	107,023	.....	.....	33
.....	.....	.....	.....	.....	.....	.....	11,572	11,572	.....	.....	500	36,000	.....	.....	34
.....	.....	.....	.....	.....	.....	.....	29,354	26,854	2,500	.....	14,800	73,926	.....	9,066	35
2,000	.....	.....	.....	.....	.....	2,000	25,500	25,200	300	.....	.....	152,750	.....	2,200	36

TABLE 4.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYÉS AT THE

	STATES AND TERRITORIES.	Number of establishments reporting.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS.												
			Aggregates.		Officers or firm members actively engaged in the industry or in supervision.					Clerks.					
					Males above 16 years.			Females above 15 years.			Males above 16 years.			Females above 15 years.	
			Average number.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.
1	The United States	707	20,296	$10,138,143	804	$22.98	$868,493	8	$12.36	$3,856	464	$16.80	$379,029	40	$8.92	$17,743
2	Alabama	11	62	15,387	6	13.51	2,693									
3	Arkansas	9	76	22,333	9	12.88	4,688				1	4.10	160			
4	California	12	393	260,497	25	29.16	35,130				6	17.29	4,870			
5	Colorado	6	121	87,249	10	43.17	22,260				5	10.56	2,700			
6	Connecticut	15	257	143,256	17	23.56	19,500				11	22.00	12,110			
7	District of Columbia	5	89	40,621							1	23.07	900			
8	Georgia	17	264	90,011	26	14.80	17,960				5	11.45	2,580			
9	Illinois	40	1,512	753,934	39	25.15	47,421	2	8.81	916	28	12.63	16,800			
10	Indiana	20	359	165,164	23	23.21	23,532				9	16.41	7,255			
11	Iowa	29	279	119,613	25	17.33	17,942				9	12.64	5,260			
12	Kansas	6	36	11,390	6	13.57	3,294									
13	Kentucky	10	201	97,886	13	20.97	12,362	1	12.12	315	6	12.53	3,800	1	5.77	300
14	Louisiana	5	51	23,767	8	14.05	5,844									
15	Maine	9	172	82,767	12	23.89	11,179				2	12.98	1,350	1	5.77	300
16	Maryland	11	623	263,797	9	23.98	10,912				8	14.67	6,102	1	4.04	210
17	Massachusetts	29	510	274,987	27	19.81	26,780				16	20.46	16,760	3	9.87	1,540
18	Michigan	11	208	96,620	12	27.20	15,870				6	14.10	4,400			
19	Minnesota	9	181	89,921	11	18.33	8,100				5	15.77	4,100			
20	Mississippi	3	46	24,980	8	18.57	7,000									
21	Missouri	45	1,093	553,904	45	28.54	59,741	1	15.00	585	35	17.71	30,922	1	13.85	720
22	New Hampshire	4	36	19,022	5	13.76	2,624									
23	New Jersey	60	4,628	2,596,699	87	33.52	143,200				107	18.49	94,722	9	9.75	4,394
24	New York	56	1,756	901,160	66	23.86	78,889				48	15.03	35,357	9	8.13	3,802
25	North Carolina	9	34	6,721	4	12.14	2,419				3	5.04	480			
26	Ohio	125	4,873	2,312,510	159	21.42	160,371	2	20.51	1,600	95	19.73	90,531	11	8.35	4,306
27	Pennsylvania	67	1,671	745,795	82	20.34	77,496	1	6.29	300	38	13.82	26,289	1	17.31	750
28	South Carolina	5	34	10,165	4	13.41	2,440				1	9.62	500			
29	Tennessee	10	74	20,400	6	13.44	4,076				1	9.23	400			
30	Texas	19	133	53,610	12	14.80	8,143	1	8.08	140	4	11.01	2,100			
31	Vermont	4	29	13,502	3	11.98	1,350							1	9.23	400
32	Virginia	10	39	7,919	6	10.80	2,434				2	5.00	260			
33	Washington	4	84	50,405	8	21.63	7,500				2	17.31	1,800			
34	West Virginia	8	68	27,828	6	13.09	4,084				1	13.85	720			
35	Wisconsin	16	150	68,820	15	17.16	12,124				4	11.15	2,320			
36	All other states (a)	8	154	85,503	10	18.02	9,135				5	13.35	3,472	2	9.81	1,020

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Delaware, 2; Florida, 1; Nebraska, 1; Oregon, 1: Rhode Island, 2; Utah, 1.

DIFFERENT WEEKLY RATES OF PAY, CLAY AND POTTERY PRODUCTS, BY STATES AND TERRITORIES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Operatives and skilled.									Unskilled.									Pieceworkers.		
Males above 16 years.			Females above 15 years.			Children.			Males above 16 years.			Females above 15 years.			Children.					
Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Total wages.	
8,171	$11.35	$4,458,924	940	$5.11	$236,360	238	$3.05	$34,796	5,779	$8.39	$2,349,484	592	$3.68	$109,928	167	$3.10	$25,186	3,093	$1,654,354	1
26	12.35	9,258	.....	.....	.....	7	2.37	410	14	4.62	1,622	.....	.....	.....	4	3.00	208	5	1,196	2
31	7.88	10,787	.....	.....	.....	15	2.29	1,660	11	5.24	2,838	2	6.03	470	1	2.56	100	6	1,630	3
165	15.39	121,294	.....	.....	.....	.....	.....	.....	190	10.86	94,483	.....	.....	.....	.....	.....	.....	7	4,720	4
66	12.23	41,009	.....	.....	.....	1	5.77	300	33	12.54	19,080	.....	.....	.....	5	5.77	1,000	1	900	5
81	10.86	43,615	.....	.....	.....	2	4.31	336	91	8.71	40,401	17	5.26	4,510	6	4.35	1,300	32	21,484	6
24	12.96	15,496	.....	.....	.....	.....	.....	.....	62	7.22	23,025	.....	.....	.....	.....	.....	.....	2	1,200	7
177	7.22	54,928	4	2.42	504	2	0.66	40	40	5.99	9,131	.....	.....	.....	.....	.....	.....	10	4,868	8
732	11.16	377,016	.....	.....	.....	26	3.00	3,483	543	8.91	246,529	35	3.14	5,720	17	2.76	2,370	90	53,679	9
200	9.06	88,148	41	3.78	8,058	.....	.....	.....	45	9.82	22,846	.....	.....	.....	.....	.....	.....	41	15,325	10
162	9.16	65,085	.....	.....	.....	.....	.....	.....	56	7.47	19,088	.....	.....	.....	.....	.....	.....	27	12,238	11
12	9.47	4,270	.....	.....	.....	3	2.46	192	8	4.78	1,574	.....	.....	.....	.....	.....	.....	7	2,060	12
70	10.32	35,720	15	3.01	2,270	.....	.....	.....	72	7.43	25,557	.....	.....	.....	.....	.....	.....	23	17,562	13
18	10.40	8,925	.....	.....	.....	.....	.....	.....	24	7.19	8,422	.....	.....	.....	.....	.....	.....	1	576	14
34	13.07	21,638	.....	.....	.....	.....	.....	.....	117	8.70	43,900	.....	.....	.....	.....	.....	.....	6	4,400	15
403	9.10	187,038	65	4.84	15,000	.....	.....	.....	88	5.97	27,299	.....	.....	.....	20	2.05	2,130	29	15,106	16
256	11.83	153,172	14	5.32	3,805	2	3.15	300	108	7.69	39,835	29	4.76	7,180	5	2.50	650	50	24,965	17
46	9.08	21,489	.....	.....	.....	7	3.09	1,124	126	7.67	47,887	.....	.....	.....	.....	.....	.....	11	5,850	18
60	9.84	29,948	.....	.....	.....	.....	.....	.....	63	8.24	26,561	2	4.62	480	4	2.88	600	36	20,132	19
24	12.96	15,000	.....	.....	.....	5	2.31	600	8	5.12	1,600	.....	.....	.....	.....	.....	.....	1	780	20
274	11.76	153,948	.....	.....	.....	5	5.77	1,500	680	8.21	282,373	1	3.85	200	10	4.02	2,019	41	21,896	21
12	12.11	6,298	8	7.88	3,276	.....	.....	.....	5	8.94	2,324	.....	.....	.....	.....	.....	.....	6	4,500	22
2,079	12.96	1,346,345	428	5.30	111,430	96	3.41	16,398	652	9.04	272,910	151	2.69	20,176	.....	.....	.....	1,019	587,124	23
793	11.38	402,368	91	5.76	26,749	2	2.51	250	520	8.46	224,548	85	3.48	15,367	10	2.40	1,246	222	112,584	24
20	3.52	2,942	.....	.....	.....	.....	.....	.....	3	3.96	480	.....	.....	.....	.....	.....	.....	4	400	25
1,394	11.36	718,093	260	4.89	61,554	33	2.53	4,338	1,441	8.51	583,280	176	4.21	36,765	45	4.23	9,418	1,257	642,254	26
800	10.10	388,746	10	4.11	2,136	6	3.56	909	537	7.18	196,630	93	3.97	18,700	31	1.82	2,795	72	31,044	27
16	7.18	5,100	.....	.....	.....	1	2.16	75	11	2.88	1,650	.....	.....	.....	.....	.....	.....	1	400	28
29	5.53	7,074	.....	.....	.....	6	1.28	350	19	5.65	4,550	.....	.....	.....	9	3.46	1,350	4	2,600	29
43	6.93	13,898	.....	.....	.....	1	2.73	142	42	6.68	11,789	.....	.....	.....	.....	.....	.....	30	17,398	30
10	10.52	5,150	.....	.....	.....	.....	.....	.....	8	6.73	2,362	.....	.....	.....	.....	.....	.....	7	4,240	31
18	5.61	3,450	.....	.....	.....	4	1.57	225	3	3.85	450	.....	.....	.....	.....	.....	.....	6	1,100	32
29	14.96	18,665	.....	.....	.....	.....	.....	.....	44	10.96	22,080	1	6.92	360	.....	.....	.....	.....	.....	33
14	7.27	4,632	.....	.....	.....	6	2.13	664	29	7.77	11,515	.....	.....	.....	.....	.....	.....	12	6,213	34
55	10.47	28,957	2	9.55	828	.....	.....	.....	54	7.25	17,381	.....	.....	.....	.....	.....	.....	20	9,210	35
88	11.29	51,422	2	7.87	750	8	3.61	1,500	32	8.32	13,484	.....	.....	.....	.....	.....	.....	7	4,720	36

TABLE 4.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYÉS AT THE

	STATES AND TERRITORIES.	AVERAGE NUMBER OF HOURS IN ORDINARY DAY OF LABOR.		WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)									
				MALES ABOVE 16 YEARS.									
		May to November.	November to May.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.
1	The United States	10.00	9.59	15,218	705	559	627	1,788	2,020	2,626	2,323	2,257	1,296
2	Alabama	10.55	9.27	46	13	6	3	.....	4	.....	5	10	3
3	Arkansas	9.89	9.44	52	4	13	11	7	2	.....	6	8	.....
4	California	9.83	9.67	386	.....	.....	.....	.....	.....	10	136	140	45
5	Colorado	9.63	9.50	114	.....	.....	.....	.....	.....	2	24	68	8
6	Connecticut	9.87	9.67	200	.....	.....	5	13	28	93	8	15	18
7	District of Columbia	10.00	10.00	87	1	3	17	42	3	4	2	6	5
8	Georgia	10.29	8.71	248	17	64	26	31	68	2	7	14	10
9	Illinois	9.83	9.40	1,342	34	48	11	158	186	260	339	191	65
10	Indiana	9.70	9.30	277	12	4	39	19	30	50	56	27	17
11	Iowa	10.05	9.78	252	34	5	12	42	35	34	32	35	13
12	Kansas	12.00	11.33	26	5	1	2	3	1	4	8	.....	.....
13	Kentucky	9.60	9.50	161	18	6	3	34	14	34	19	14	9
14	Louisiana	9.70	9.70	50	1	2	1	19	2	10	7	5	1
15	Maine	9.67	9.67	165	1	.....	2	40	46	33	13	12	6
16	Maryland	10.00	9.64	508	53	76	10	202	10	50	19	29	12
17	Massachusetts	9.97	9.90	407	21	11	19	32	35	71	75	62	53
18	Michigan	9.64	9.55	190	16	10	30	53	5	28	18	12	12
19	Minnesota	9.67	9.44	139	1	.....	10	10	30	62	8	1	15
20	Mississippi	9.33	9.00	40	2	13	.....	3	.....	.....	.....	.....	17
21	Missouri	10.13	9.36	1,034	27	24	50	163	217	285	79	76	52
22	New Hampshire	10.00	10.00	22	.....	.....	.....	.....	3	5	5	5	3
23	New Jersey	10.17	9.97	2,925	66	59	70	220	238	297	657	682	293
24	New York	9.80	9.55	1,337	41	55	36	164	115	311	221	194	121
25	North Carolina	10.56	9.44	30	20	1	3	3	.....	.....	.....	2	1
26	Ohio	9.67	9.43	3,089	117	65	106	385	604	628	244	404	377
27	Pennsylvania	10.19	9.40	1,457	99	66	110	89	297	269	217	168	92
28	South Carolina	10.20	9.00	32	22	.....	.....	1	.....	1	2	3	3
29	Tennessee	9.90	9.40	55	24	4	12	2	.....	5	3	4	.....
30	Texas	10.26	9.53	101	28	4	22	6	2	21	6	4	5
31	Vermont	10.00	10.00	21	2	.....	1	3	2	1	7	4	1
32	Virginia	10.20	9.20	29	10	11	.....	.....	.....	1	5	2	.....
33	Washington	10.00	10.00	83	.....	.....	.....	5	1	3	23	24	22
34	West Virginia	10.00	9.75	50	7	.....	5	2	28	2	2	1	.....
35	Wisconsin	9.88	9.81	128	7	3	8	25	8	33	22	7	7
36	All other states	9.75	9.25	135	2	5	3	12	6	17	48	28	10

a In comparing the weekly rates of wages and the number of employés at each rate with the average weekly earnings presented in the first part of this table, it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for the employés at the respective rates.

DIFFERENT WEEKLY RATES OF PAY, CLAY AND POTTERY PRODUCTS, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

MALES ABOVE 16 YEARS—continued.		FEMALES ABOVE 15 YEARS.											CHILDREN.				
$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under 8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	
474	543	1,580	1,058	169	170	48	42	53	18	16	4	2	405	377	23	5	1
	2												11	11			2
1		2			2								16	16			3
21	34																4
3	9												6		5	1	5
10	10	17	7		2	4	4						8	8			6
2	2																7
3	6	4	4										2	2			8
14	36	37	35				1	1					43	35	8		9
12	11	41	35	4	1	1											10
7	3																11
2													3	3			12
6	4	17	12	3	1					1							13
1	1																14
5	7	1		1													15
38	9	66	66										20	20			16
17	11	46	33	6	2	1		2	2				7	7			17
3	3												7	7			18
	2	2	2										4	4			19
5													5	5			20
19	42	3	1							1	1		15	8	7		21
1		8		3	2			1		1	1						22
141	202	588	377	89	24	20	22	37	11	7	1		96	96			23
33	46	185	101	35	27	2	13	3	3			1	12	12			24
																	25
91	68	449	284	25	107	19	1	6		6		1	78	73	1	4	26
23	27	105	101	2	1						1		37	35	2		27
													1	1			28
	1												15	15			29
3		1					1						1	1			30
		1						1									31
													4	4			32
4	1	1			1												33
2	1												6	6			34
6	2	2				1			1								35
1	3	4		1				2	1				8	8			36

TABLE 5.—DAILY RATES OF WAGES, BY OCCUPATIONS, CLAY AND POTTERY PRODUCTS: 1890.

OCCUPATIONS.	DAILY RATES OF WAGES AND NUMBER OF EMPLOYÉS AT EACH RATE.													Average daily rate.	Average number of working hours per day.	Average number of days employed during the year.
	Total number.	Under $0.50.	$0.50 to $1.00.	$1.00 to $1.50.	$1.50 to $2.00.	$2.00 to $2.50.	$2.50 to $3.00.	$3.00 to $3.50.	$3.50 to $4.00.	$4.00 to $4.50.	$4.50 to $5.00.	$5.00 to $5.50.	$5.50 to $6.00.	$6.00 and over.			
Total	8,352	33	783	1,984	2,508	1,551	589	403	115	128	24	215	7	12	$1.79	9.73	285
Basin makers:																	
Males above 16 years	15					3	2	6	2			2			3.13	9.80	308
Biscuitware brushers:																	
Males above 16 years	39		19	18		2									0.92	9.66	284
Females above 15 years	222		201	21											0.75		
Casters:																	
Males above 16 years	32			8	6	10		1	6	1					2.20	9.89	303
Decorators:																	
Males above 16 years	167			1	2	83	31	45	5						2.40	9.75	281
Females above 15 years	121		4	51	55	6	5								1.41		
Department foremen:																	
Males above 16 years	123				12	11	45	31	6	6	6	6			2.84	9.85	278
Females above 15 years	6			3	1		2								1.63		
Dippers:																	
Males above 16 years	62		1	6	12	7	26	9				1			2.24	9.49	284
Females above 15 years	16		13			3									0.85		
Dippers' help:																	
Males above 16 years	46		34	12											0.81	9.54	285
Females above 15 years	47		44		3										0.72		
Children	8		5	3											0.82		
Dish makers:																	
Males above 16 years	48			19		3	4	20	2						2.27	9.72	291
Drivers:																	
Males above 16 years	238	3	3	57	141	27	3	4							1.56	9.79	289
Engineers:																	
Males above 16 years	147		1	7	29	69	28	10	3						2.12	9.95	284
Engravers:																	
Males above 16 years	7							4	3						3.21	9.29	259
Fillers in:																	
Males above 16 years	9			7	1	1									1.22	9.77	274
Females above 15 years	254		128	99	27										0.80		
Children	6		6												0.77		
Fire-brick makers:																	
Males above 16 years	57				34	19	4								1.76	9.72	261
Firemen:																	
Males above 16 years	221		1	24	84	65	23	18	1	3	2				1.98	10.04	292
Glostware dressers:																	
Males above 16 years	25		11	14											0.89	9.70	276
Females above 15 years	136		97	37	2										0.85		
Handlers:																	
Males above 16 years	39			5	5	9	10	8	1					1	2.33	9.59	284
Handlers' help:																	
Males above 16 years	45		34	8	2	1									0.84	9.54	288
Children	14		14												0.71		
Jiggerers:																	
Males above 16 years	207		2	19	32	22	38	40	10	26	11	7			2.70	9.72	280
Kilnmen:																	
Males above 16 years	920			106	310	404	85	11				4			1.83	9.85	283
Laborers:																	
Males above 16 years	1,833		34	1,078	683	38									1.38	9.79	275
Children	57	25	27	5											0.46		
Machinists:																	
Males above 16 years	14				2	4	5	2		1					2.42	9.83	297
Managers:																	
Males above 16 years	160				14	24	17	37	3	28	1	25	1	10	3.51	9.83	292
Metal die pressers:																	
Males above 16 years	10				3	4	3								2.04	9.86	303
Mixers of clay:																	
Males above 16 years	407		6	85	248	60	4	2		2					1.59	9.81	276
Modelers:																	
Males above 16 years	160			1	7	18	28	26	22	35	4	15	3	1	3.34	9.47	280
Mold makers:																	
Males above 16 years	163			4	7	55	50	39	4	2		2			2.48	9.57	278
Packers:																	
Males above 16 years	229		2	29	102	64	19	11		2					1.81	9.74	285
Pin and stilt makers:																	
Males above 16 years	11			3	7	1									1.46	9.75	284
Females above 15 years	4		3		1										0.94		

TABLE 5.—DAILY RATES OF WAGES, BY OCCUPATIONS, CLAY AND POTTERY PRODUCTS: 1890—Continued.

OCCUPATIONS.	DAILY RATES OF WAGES AND NUMBER OF EMPLOYÉS AT EACH RATE.													Average daily rate.	Average number of working hours per day.	Average number of days employed during the year.
	Total number.	Under $0.50.	$0.50 to $1.00.	$1.00 to $1.50.	$1.50 to $2.00.	$2.00 to $2.50.	$2.50 to $3.00.	$3.00 to $3.50.	$3.50 to $4.00.	$4.00 to $4.50.	$4.50 to $5.00.	$5.00 to $5.50.	$5.50 to $6.00.	$6.00 and over.			
Pressers:																	
Males above 16 years	804		1	15	194	309	69	28	40			148			2.61	9.73	287
Children	21		3	18											1.08		
Printers:																	
Males above 16 years	41				6	14	18	3							2.28	9.70	274
Females above 15 years	22		1		18	3									1.52		
Sagger makers:																	
Males above 16 years	49			1	5	20	8	3	4	3		2	3		2.71	9.67	291
Sagger-makers' help:																	
Males above 16 years	40		1	8	29	2									1.31	9.57	292
Selecters:																	
Males above 16 years	50		1	19	26	4									1.40	9.88	288
Females above 15 years	7			4				2							1.95		
Selecters' help:																	
Males above 16 years	13		2	9	2										1.10	9.85	281
Children	15	5	10												0.52		
Sewer-pipe makers:																	
Males above 16 years	457			93	252	104	8								1.63	9.82	278
Spongers:																	
Males above 16 years	40		32	8											0.85	9.50	279
Females above 15 years	78		39	37	2										0.84		
Throwers:																	
Males above 16 years	45		3	6	14	5	12			2		3			2.07	9.50	294
Turners:																	
Males above 16 years	211			10	60	48	34	40	2	17					2.31	9.66	282
Warehousemen:																	
Males above 16 years	82			21	29	21	8	2	1						1.49	9.76	283
Watchmen:																	
Males above 16 years	52			5	39	8									1.61	10.18	315

TABLE 6.—COMPARATIVE STATEMENT, BRICK AND TILE, BY STATES AND TERRITORIES: 1880 AND 1890.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
The United States	1880	5,631	$27,073,616	66,355	$13,443,532	59,032	268	7,055	$9,774,834	$32,833,587
	1890	5,828	82,578,566	109,151	32,695,189	104,119	266	4,766	12,639,597	67,770,695
Alabama	1880	38	78,525	567	68,397	428	.....	139	53,225	159,952
	1890	59	705,168	1,579	350,689	1,419	13	147	160,754	778,950
Arizona	1880	1	2,500	10	4,500	10	.....	.....	2,250	9,600
	1890	3	1,210	31	2,600	31	.....	.....	700	4,300
Arkansas	1880	32	38,700	375	53,775	339	.....	36	36,000	117,370
	1890	48	296,028	709	167,675	644	.....	65	100,107	484,885
California	1880	50	378,650	839	210,035	838	.....	1	157,625	516,261
	1890	52	1,478,991	1,447	628,842	1,442	1	4	345,349	1,371,654
Colorado	1880	46	362,600	830	267,410	797	.....	33	194,003	605,028
	1890	83	1,747,782	2,254	1,099,513	2,194	5	55	306,933	2,023,076
Connecticut	1880	48	328,350	541	132,476	511	9	21	91,022	299,194
	1890	28	971,710	992	317,200	973	14	5	105,930	595,200
Dakota (a)	1880	14	25,600	108	33,622	108	.....	.....	16,366	66,685
	1890	17	133,700	299	68,442	299	.....	.....	24,218	180,425
Delaware	1880	15	102,400	307	55,216	230	.....	77	33,683	125,610
	1890	13	250,982	427	143,136	406	.....	21	30,341	268,534
District of Columbia	1880	16	330,600	696	123,161	576	.....	120	62,575	314,298
	1890	13	772,681	1,204	442,929	1,125	.....	79	208,430	846,950
Florida	1880	9	7,850	107	12,458	104	.....	3	9,750	28,100
	1890	12	139,770	237	60,597	214	1	22	19,805	119,260
Georgia	1880	76	212,660	1,228	188,883	1,022	14	192	115,747	409,025
	1890	61	950,263	2,080	473,872	2,017	.....	63	253,922	1,201,542
Idaho	1880	2	2,500	11	3,340	11	.....	.....	1,850	6,900
	1890	5	11,405	38	4,710	38	.....	.....	1,690	9,800
Illinois	1880	616	2,397,023	5,903	1,288,604	5,319	13	571	955,584	3,065,302
	1890	604	8,995,599	9,697	3,216,826	9,301	20	376	1,069,369	6,399,492
Indiana	1880	735	1,408,264	4,240	716,254	3,908	4	328	694,226	1,927,858
	1890	764	3,181,744	6,137	1,317,120	5,913	17	207	449,195	2,829,033
Iowa	1880	280	478,614	2,251	426,120	2,063	13	175	270,963	944,497
	1890	260	1,802,942	2,742	707,368	2,655	7	80	282,431	1,537,890
Kansas	1880	103	125,825	1,046	174,111	948	19	79	90,935	355,668
	1890	87	788,607	1,280	313,146	1,209	6	65	128,701	667,457
Kentucky	1880	115	302,175	1,379	233,702	1,162	1	216	145,503	506,705
	1890	99	826,958	1,957	476,845	1,823	3	131	185,577	1,011,603
Louisiana	1880	31	87,425	358	68,626	305	13	40	30,067	133,265
	1890	22	315,453	540	143,051	516	4	20	55,841	291,125
Maine	1880	96	280,549	637	106,538	621	.....	16	122,887	310,958
	1890	118	437,655	1,073	279,138	1,029	39	5	132,157	511,760
Maryland	1880	79	1,168,158	2,251	478,189	2,049	.....	202	243,284	933,988
	1890	64	2,560,902	2,508	681,475	2,410	1	97	217,385	1,481,603
Massachusetts	1880	114	1,668,200	2,401	465,589	2,370	9	22	521,875	1,322,628
	1890	110	3,014,277	3,261	1,090,450	3,255	6	.....	598,587	2,314,406
Michigan	1880	179	710,259	1,933	346,845	1,730	45	158	236,878	822,475
	1890	185	1,585,955	2,616	538,750	2,565	9	42	218,353	1,179,605
Minnesota	1880	87	281,705	1,010	200,208	928	5	77	114,610	502,975
	1890	117	1,584,356	2,221	502,183	2,128	7	86	255,956	1,116,739
Mississippi	1880	54	106,125	709	89,053	593	4	112	42,979	194,670
	1890	33	196,745	696	134,073	651	.....	45	61,643	295,939
Missouri	1880	230	989,415	2,737	705,975	2,271	8	458	388,364	1,602,522
	1890	232	4,690,716	4,834	1,706,492	4,458	8	368	709,626	3,503,906
Montana	1880	5	17,500	68	21,400	68	.....	.....	11,400	43,150
	1890	11	173,650	252	104,342	250	.....	2	53,088	238,610
Nebraska	1880	87	130,740	662	150,189	585	3	74	102,078	349,478
	1890	155	2,791,774	2,720	844,850	2,570	5	145	484,918	2,173,632
Nevada	1880	2	1,200	13	3,974	13	.....	.....	1,245	8,355
	1890	(b)	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire	1880	67	120,845	642	118,408	642	.....	.....	90,251	282,725
	1890	62	535,723	1,498	342,275	1,495	2	1	192,458	789,856
New Jersey	1880	107	1,731,300	2,749	665,482	2,575	26	148	559,037	1,672,533
	1890	95	5,090,722	4,798	1,529,481	4,655	2	141	510,654	2,826,074
New Mexico	1880	1	800	8	600	8	.....	.....	500	1,500
	1890	(b)	.....	.....	.....	.....	.....	.....	.....	.....
New York	1880	321	3,923,405	7,363	1,613,766	6,715	29	619	1,196,925	4,108,464
	1890	275	8,411,230	10,806	3,435,415	10,575	24	207	1,121,035	6,683,529

a North and South Dakota combined for 1890.

b None reported in 1890.

TABLE 6.—COMPARATIVE STATEMENT, BRICK AND TILE, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
North Carolina	1880	66	$54,390	614	$49,928	433	3	178	$34,657	$150,874
	1890	62	263,644	1,037	148,110	943	1	93	64,313	333,150
North Dakota (a)	1890	6	30,095	80	18,495	80	.....	.....	6,595	45,775
Ohio	1880	825	2,723,528	6,127	1,114,183	5,527	17	583	1,185,794	3,481,291
	1890	875	6,212,838	9,301	2,649,165	8,907	13	381	1,022,930	5,813,437
Oklahoma (b)	1890	3	2,990	16	6,684	16	.....	.....	1,491	11,500
Oregon	1880	23	55,496	187	43,814	184	1	2	19,197	104,240
	1890	47	656,151	701	237,773	689	.....	12	66,230	461,648
Pennsylvania	1880	521	5,628,524	8,426	2,077,168	7,135	6	1,285	1,332,758	4,813,153
	1890	509	12,917,885	13,612	4,764,392	12,437	30	1,145	1,741,000	9,403,715
Rhode Island	1880	1	100,000	195	32,000	195	.....	.....	24,000	75,000
	c1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina	1880	29	31,100	367	35,903	269	2	96	17,208	80,819
	1890	39	232,432	787	121,238	723	.....	64	45,650	265,598
South Dakota (a)	1890	11	103,605	219	49,947	219	.....	.....	17,623	134,650
Tennessee	1880	90	343,354	1,553	247,227	1,224	7	322	139,568	523,113
	1890	78	1,046,216	2,090	656,806	1,903	8	179	188,797	1,244,367
Texas	1880	113	183,530	1,185	204,499	1,042	8	135	105,074	448,418
	1890	124	1,054,414	2,040	864,378	1,979	2	59	249,132	1,214,690
Utah	1880	28	121,575	188	34,890	147	.....	41	19,825	85,392
	1890	40	279,147	758	232,458	692	.....	66	66,551	421,658
Vermont	1880	25	133,250	224	38,610	216	.....	8	18,735	83,650
	1890	16	86,575	197	34,973	191	.....	6	17,008	89,991
Virginia	1880	84	290,085	1,425	188,072	1,180	.....	245	80,420	398,789
	1890	88	1,547,617	2,441	607,211	2,300	.....	141	214,553	1,343,598
Washington	1880	2	3,000	16	2,430	16	.....	.....	1,150	6,000
	1890	86	1,058,965	1,826	684,461	1,799	9	18	213,884	1,389,650
West Virginia	1880	47	242,950	446	111,301	384	1	61	39,961	218,710
	1890	27	202,946	403	116,781	368	1	34	57,399	249,493
Wisconsin	1880	119	560,872	1,395	231,351	1,205	8	182	161,400	607,669
	1890	137	2,388,393	2,819	680,795	2,726	8	85	373,361	1,642,465
Wyoming	1880	2	1,500	28	5,300	28	.....	.....	1,400	8,500
	1890	7	28,970	31	11,410	31	.....	.....	3,723	25,900
All other states	c1890	3	154,735	159	55,069	155	.....	4	28,512	123,000

a See Dakota.
b Part of Indian territory in 1880, from which no reports were received.
c Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Indian territory, 1; Rhode Island, 2.

TABLE 7.—DETAILED STATEMENT, BRICK AND

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.				
			Aggregate.	Value of plant.			
				Total.	Land.	Buildings.	Machinery, tools, and implements.
1	The United States	5,828	$82,578,566	$53,629,375	$21,031,133	$14,601,046	$17,997,196
2	Alabama	59	705,168	463,743	107,658	147,570	208,515
3	Arizona	3	1,210	610	55	55	500
4	Arkansas	48	296,028	212,098	90,916	32,765	88,417
5	California	52	1,478,991	727,711	198,800	241,546	287,365
6	Colorado	83	1,747,782	735,552	364,815	110,210	260,527
7	Connecticut	28	971,710	577,393	234,393	131,600	211,400
8	Delaware	13	250,982	160,083	7,625	88,250	64,208
9	District of Columbia	13	772,681	575,650	321,500	78,300	175,850
10	Florida	12	139,770	114,365	54,315	19,550	40,500
11	Georgia	61	950,253	650,658	319,050	125,323	206,285
12	Idaho	5	11,405	3,850	700	1,600	1,550
13	Illinois	604	8,995,599	6,155,722	2,149,830	1,885,629	2,120,263
14	Indiana	764	3,181,744	2,067,451	628,463	691,525	747,463
15	Iowa	260	1,802,942	1,206,751	407,690	368,663	430,398
16	Kansas	87	788,607	446,777	128,820	111,365	206,592
17	Kentucky	99	826,958	537,345	238,085	125,731	173,529
18	Louisiana	22	315,453	240,138	110,175	61,250	68,713
19	Maine	118	437,655	225,238	78,706	62,042	84,490
20	Maryland	64	2,560,902	1,362,651	550,651	382,206	429,794
21	Massachusetts	110	3,014,277	1,657,986	720,390	498,071	439,525
22	Michigan	185	1,585,955	1,117,073	478,490	226,294	412,289
23	Minnesota	117	1,584,356	1,020,480	619,590	152,950	247,940
24	Mississippi	33	196,745	115,300	36,425	36,320	42,555
25	Missouri	232	4,690,716	3,456,366	1,572,769	903,140	980,457
26	Montana	11	173,650	107,200	42,540	22,560	42,100
27	Nebraska	155	2,791,774	1,770,372	674,760	614,775	480,837
28	New Hampshire	62	535,723	231,685	88,475	56,625	86,585
29	New Jersey	95	5,090,722	3,330,300	1,203,950	1,195,150	1,431,200
30	New York	275	8,411,230	5,680,333	2,109,331	1,492,332	2,078,670
31	North Carolina	62	263,644	154,410	59,935	31,595	62,880
32	North Dakota	6	30,095	16,670	5,270	5,300	6,100
33	Ohio	875	6,212,838	3,960,003	1,294,326	1,200,048	1,465,629
34	Oklahoma	3	2,990	2,550	1,500	500	550
35	Oregon	47	656,151	403,155	294,750	39,455	68,950
36	Pennsylvania	509	12,917,835	8,345,793	3,414,045	2,543,217	2,388,531
37	South Carolina	39	232,432	151,738	54,798	24,770	72,170
38	South Dakota	11	103,605	60,530	23,325	10,030	27,175
39	Tennessee	78	1,046,216	641,545	218,197	97,358	325,990
40	Texas	124	1,054,414	688,348	304,985	140,155	243,208
41	Utah	40	279,147	158,925	82,780	12,485	63,660
42	Vermont	16	86,575	45,775	22,700	10,925	12,150
43	Virginia	88	1,547,617	970,765	455,005	140,580	375,180
44	Washington	86	1,058,965	677,265	235,755	128,255	313,255
45	West Virginia	27	202,946	155,297	54,915	50,828	49,554
46	Wisconsin	137	2,388,398	1,575,505	886,085	259,873	429,547
47	Wyoming	7	26,970	19,570	13,795	1,875	3,900
48	All other states (a)	3	154,735	150,650	70,000	40,500	40,150

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Indian territory, 1; Rhode Island, 2.

TILE, BY STATES AND TERRITORIES: 1890.

CAPITAL—continued.				MISCELLANEOUS EXPENSES.							
Live assets.											
Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Amount paid to contractors.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	
$28,949,191	$3,183,066	$13,130,391	$12,635,734	$5,108,769	$1,201,998	$353,355	$178,619	$1,203,693	$181,624	$518,447	$1,471,033	1
241,425	104,285	65,130	72,010	53,364	25,205	2,837	788	11,975	.....	2,889	9,670	2
600	.....	550	50	37	37	.....	.....	.....	.....	.....	.....	3
83,930	6,089	55,220	22,630	32,992	3,119	1,426	323	5,855	14,400	3,140	4,729	4
751,280	81,540	332,244	337,496	83,013	17,937	6,236	1,888	13,842	.....	2,799	40,311	5
1,012,230	230,510	467,262	314,458	114,461	55,285	6,760	2,546	23,223	.....	9,708	16,939	6
394,317	31,035	200,650	162,632	23,739	3,382	3,672	1,050	9,900	.....	1,785	3,950	7
90,899	11,065	57,034	22,800	19,923	10,250	367	525	2,315	.....	1,441	5,025	8
197,031	14,100	88,400	94,531	63,031	610	5,960	1,190	18,210	.....	4,000	33,061	9
25,405	2,750	10,730	11,925	12,353	5,629	503	276	1,510	.....	2,900	1,535	10
299,605	65,375	101,570	132,660	68,580	10,243	4,463	1,665	14,862	17,450	3,854	16,043	11
7,555	655	6,600	300	1,102	820	22	.....	110	.....	.....	150	12
2,839,877	297,767	1,375,459	1,166,651	575,457	132,142	39,837	26,942	186,086	2,121	46,172	142,157	13
1,114,293	96,494	506,450	511,349	175,084	30,159	17,543	7,992	58,001	.....	26,813	34,576	14
596,191	58,930	297,836	239,425	84,811	19,140	8,532	4,495	25,750	540	15,942	10,412	15
341,830	127,585	128,065	86,180	45,896	14,983	3,422	2,627	7,767	.....	8,909	8,188	16
289,613	24,257	126,699	138,657	79,871	11,792	5,352	2,185	14,139	.....	6,500	39,903	17
75,315	10,840	39,675	24,800	18,254	108	2,669	790	4,247	.....	1,650	8,790	18
212,417	21,055	111,310	80,052	30,383	2,874	2,588	912	8,958	.....	2,569	12,482	19
1,198,251	101,403	378,723	718,125	279,437	47,625	11,447	3,947	25,277	118,114	22,983	50,044	20
1,356,291	155,195	667,059	534,037	156,191	14,337	19,394	7,575	35,525	2,600	12,474	64,286	21
468,882	55,964	256,555	156,363	67,479	7,788	5,728	1,405	23,366	....	9,181	20,011	22
563,876	143,560	258,877	161,439	77,487	16,382	7,765	2,299	20,300	4,810	13,205	12,726	23
81,445	13,875	33,770	33,800	11,053	1,046	1,367	335	2,380	.....	1,575	4,350	24
1,234,350	102,146	444,539	687,665	251,978	37,442	18,464	13,423	66,280	.....	33,121	83,248	25
66,450	1,600	47,950	16,900	9,335	3,025	455	570	1,950	.....	960	1,775	26
1,021,402	99,206	438,332	483,864	138,257	17,942	11,410	7,674	53,139	.....	30,909	17,183	27
304,038	51,490	163,467	89,081	28,690	4,066	2,726	1,410	6,077	5,000	2,006	7,405	28
1,260,422	100,158	558,832	601,432	246,487	14,589	10,345	8,494	54,755	.....	45,685	112,619	29
2,730,897	219,921	1,336,512	1,174,464	944,775	361,121	38,566	17,168	138,725	11,364	53,580	324,242	30
109,234	17,060	54,786	37,388	11,940	2,301	845	479	4,510	500	1,465	1,840	31
13,425	3,700	4,750	4,975	1,888	300	283	.....	1,280	.....	.....	25	32
2,252,835	161,843	1,996,897	994,095	368,908	73,351	33,260	16,327	106,578	625	40,025	98,742	33
440	240	200	.....	390	195	.....	.....	25	.....	20	150	34
252,996	24,435	154,635	73,926	15,237	4,085	2,490	292	3,230	100	2,525	2,515	35
4,572,042	312,268	1,873,936	2,385,838	636,165	187,400	42,071	24,257	158,659	.....	44,189	179,589	36
80,694	14,794	36,615	29,285	16,450	8,356	455	280	3,470	.....	2,020	1,869	37
43,075	5,250	28,125	9,700	3,678	20	689	71	930	.....	1,460	508	38
404,671	24,045	171,734	208,892	55,756	8,513	5,707	5,555	19,643	.....	11,036	5,302	39
366,066	47,630	192,685	125,751	53,868	3,514	4,993	1,448	15,675	.....	7,928	20,310	40
120,222	14,550	73,010	32,662	27,601	15,600	623	28	3,605	4,000	2,720	1,025	41
40,800	5,100	19,650	16,050	3,086	225	203	50	855	.....	528	1,225	42
576,852	121,516	210,652	244,684	46,615	8,329	4,149	2,866	16,440	.....	5,605	9,226	43
381,700	51,350	223,270	107,080	55,702	13,392	3,285	1,743	10,360	.....	6,237	20,685	44
47,649	6,353	23,746	17,550	3,036	605	457	347	720	.....	721	186	45
812,888	143,506	397,900	271,482	114,503	5,999	13,878	4,382	23,114	.....	25,184	41,946	46
9,400	.....	8,800	600	351	135	111	.....	50	.....	25	30	47
4,085	585	3,500	.....	75	.....	.....	.....	25	.....	.....	50	48

TABLE 7.—DETAILED STATEMENT, BRICK AND

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					
		Aggregates.		Officers, firm members, and clerks.			
				Males above 16 years.		Females above 15 years.	
		Average number.	Total wages.	Number.	Wages.	Number.	Wages.
1	The United States	109,151	$32,695,189	4,921	$2,966,263	54	$19,569
2	Alabama	1,579	350,689	48	30,446		
3	Arizona	31	2,600				
4	Arkansas	709	167,675	39	25,592		
5	California	1,447	628,842	55	55,063		
6	Colorado	2,254	1,099,513	109	100,065	1	262
7	Connecticut	992	317,200	41	30,418		
8	Delaware	427	143,136	17	15,086		
9	District of Columbia	1,204	442,929	22	25,359		
10	Florida	237	60,597	22	11,239		
11	Georgia	2,080	473,872	61	46,420		
12	Idaho	38	4,710	3	510		
13	Illinois	9,697	3,216,826	540	329,996	4	1,450
14	Indiana	6,137	1,317,120	535	180,913	3	750
15	Iowa	2,742	707,368	196	78,004	3	776
16	Kansas	1,280	313,146	52	27,478	2	443
17	Kentucky	1,957	476,845	99	53,306	3	815
18	Louisiana	540	143,051	29	20,007		
19	Maine	1,073	279,138	66	27,802		
20	Maryland	2,508	681,475	72	54,347	1	50
21	Massachusetts	3,261	1,090,450	129	91,027	3	1,195
22	Michigan	2,616	538,750	130	42,582	1	350
23	Minnesota	2,221	502,183	148	59,686		
24	Mississippi	696	134,073	28	11,634		
25	Missouri	4,834	1,706,492	224	175,160	5	3,252
26	Montana	252	104,342	8	6,440		
27	Nebraska	2,720	844,850	133	84,309	1	155
28	New Hampshire	1,498	342,275	28	13,290		
29	New Jersey	4,798	1,529,481	127	93,507	2	920
30	New York	10,806	3,435,415	268	204,383	5	1,768
31	North Carolina	1,037	148,110	41	16,307		
32	North Dakota	80	18,495	2	950		
33	Ohio	9,301	2,649,165	639	327,618	5	2,140
34	Oklahoma	16	6,684	2	497		
35	Oregon	701	237,773	38	38,069		
36	Pennsylvania	13,612	4,764,392	456	372,564	10	3,128
37	South Carolina	787	121,238	23	10,115		
38	South Dakota	219	49,947	14	5,534		
39	Tennessee	2,090	656,806	78	59,356		
40	Texas	2,040	564,378	83	53,375	1	250
41	Utah	758	232,458	30	16,101		
42	Vermont	197	34,973	7	2,517		
43	Virginia	2,441	607,211	82	48,698		
44	Washington	1,826	684,461	60	37,292	2	1,000
45	West Virginia	403	116,781	15	9,165	1	65
46	Wisconsin	2,819	680,795	114	69,157	1	800
47	Wyoming	31	11,410	2	390		
48	All other states	159	55,069	6	4,489		

TILE, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.												
Operatives, skilled and unskilled.						Pieceworkers.						
Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.		
Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
93,614	$27,471,360	152	$21,616	4,369	$474,926	5,584	$1,675,949	60	$15,811	397	$49,695	1
1,306	284,005	7	784	136	16,796	65	16,762	6	60	11	1,830	2
31	2,600											3
548	125,374			65	7,075	57	9,634					4
1,275	546,028	1	360	4	486	112	26,905					5
2,002	941,037	4	660	55	9,558	83	47,931					6
881	256,748	5	1,320	5	650	51	24,500	9	3,564			7
379	123,104			17	1,646	10	2,700			4	600	8
1,031	384,708			75	15,000	72	16,862			4	1,000	9
189	45,073	1	175	22	3,110	3	1,000					10
1,816	403,394			58	4,583	140	19,350			5	125	11
35	4,200											12
7,873	2,503,839	16	2,181	333	36,550	888	335,543			43	7,267	13
4,997	1,016,862	10	709	189	16,089	381	99,807	4	280	18	1,710	14
2,325	584,723			71	5,286	234	37,246	4	363	9	970	15
1,054	244,717	4	420	65	5,449	103	34,639					16
1,509	363,818			108	9,252	215	47,526			23	2,128	17
447	109,421	4	700	15	918	40	11,173			5	832	18
923	214,005	2	714	4	300	40	24,731	37	11,544	1	42	19
1,793	504,582			67	6,809	545	113,797			30	1,890	20
3,021	963,939	3	630			105	33,659					21
2,375	478,385	8	1,433	42	3,220	60	12,780					22
1,958	428,585	7	443	81	6,589	22	6,700			5	180	23
563	106,932			45	3,107	60	12,400					24
3,935	1,372,750	3	230	336	47,326	299	105,715			32	2,059	25
230	91,802			2	100	12	6,000					26
2,377	726,607	4	497	145	20,102	60	13,180					27
1,467	328,631	2	264	1	90							28
4,420	1,384,644			131	12,513	108	36,935			10	962	29
10,260	3,184,113	19	2,438	206	25,461	47	17,049			1	203	30
902	125,910	1	100	90	5,721					3	72	31
78	17,545											32
7,606	2,107,744	8	513	332	30,673	662	173,463			49	7,014	33
14	6,187											34
649	198,601			12	1,023	2	80					35
11,073	3,929,541	20	4,136	1,015	128,068	908	306,793			130	20,162	36
698	106,830			64	4,228	2	65					37
205	44,413											38
1,788	578,600	8	1,483	172	13,334	37	3,962			7	71	39
1,814	480,661	1	150	59	7,311	82	22,631					40
638	199,450			63	7,275	24	9,092			3	540	41
184	32,006			6	450							42
2,141	536,923			137	8,258	77	13,300			4	32	43
1,716	631,260	7	726	18	1,171	23	13,012					44
344	100,998			34	3,813	9	2,740					45
2,568	589,065	7	550	85	5,336	44	15,887					46
29	11,020											47
147	49,980			4	200	2	400					48

TABLE 7.—DETAILED STATEMENT, BRICK AND

	STATES AND TERRITORIES.	MATERIALS USED.										Rent of power and heat.	Cost of all other materials.
		Total cost.	Wood.		Coal.		Oil.		Natural gas.				
			Cords.	Cost.	Tons.	Cost.	Gallons.	Cost.	Number of 1,000 feet.	Cost.			
1	The United States	$12,639,597	1,869,913	$5,533,826	1,776,657	$4,513,160	8,019,934	$228,703	3,237,637	$260,668		$6,352	$2,096,888
2	Alabama	160,754	20,844	45,640	48,915	89,493							25,621
3	Arizona	700	215	700									
4	Arkansas	100,107	30,093	66,058	7,000	18,000	10	5					16,044
5	California	345,349	39,722	228,899	10,885	83,475	6,500	1,346				50	31,579
6	Colorado	306,933	27,370	141,895	52,271	126,491							38,547
7	Connecticut	105,930	17,887	66,558	6,642	28,912	20	12					10,448
8	Delaware	30,341	631	1,917	7,210	26,640							1,784
9	District of Columbia	208,430	26,626	105,577	22,022	79,926	250,000	10,000					12,927
10	Florida	19,805	10,232	19,445			1,500	300					60
11	Georgia	253,922	84,261	200,181	20,752	45,244	1,150	182					8,315
12	Idaho	1,690	382	1,490									200
13	Illinois	1,069,369	79,972	249,319	253,205	496,617	6,228,614	185,327					138,106
14	Indiana	449,195	144,471	287,970	36,720	67,849	800	120	549,227	40,541		902	51,813
15	Iowa	282,431	33,148	101,789	64,948	154,815							25,827
16	Kansas	128,701	12,395	43,540	31,137	79,799						400	4,962
17	Kentucky	185,577	27,791	70,678	44,820	94,796	50	5					20,098
18	Louisiana	55,841	24,432	48,321	2,385	6,145							1,375
19	Maine	132,157	38,861	121,538	578	2,967							7,652
20	Maryland	217,385	9,204	31,043	50,821	139,586							46,756
21	Massachusetts	598,587	106,655	438,386	17,323	81,156							79,045
22	Michigan	218,353	78,638	147,871	6,721	18,783	142,000	2,130	178,136	22,267		250	27,052
23	Minnesota	255,956	89,785	232,244	585	2,070							21,642
24	Mississippi	61,643	22,495	53,776	1,083	3,586							4,281
25	Missouri	709,626	58,578	184,567	156,224	348,129							176,930
26	Montana	53,088	6,491	29,179	4,413	16,500							7,409
27	Nebraska	484,918	21,681	95,270	103,111	343,384						3,700	42,564
28	New Hampshire	192,458	54,775	179,817	1,242	5,960							6,681
29	New Jersey	510,654	18,376	71,732	87,278	299,939							138,983
30	New York	1,121,035	166,791	741,795	77,622	246,621	328,000	8,200				750	123,669
31	North Carolina	64,313	30,194	58,117	584	1,916							4,280
32	North Dakota	6,595	2,530	5,690	150	350							555
33	Ohio	1,022,930	173,857	371,330	193,893	371,982	834,950	16,410	493,675	32,088		300	230,820
34	Oklahoma	1,491	580	1,470									21
35	Oregon	66,230	24,568	63,037					800	80			3,113
36	Pennsylvania	1,741,000	28,146	79,186	275,809	830,690	226,340	4,666	2,006,599	164,764			661,694
37	South Carolina	45,650	24,875	44,342	1	10							1,298
38	South Dakota	17,623	2,760	11,032	1,289	6,175							416
39	Tennessee	188,797	41,080	92,770	28,308	69,189			200	28			26,810
40	Texas	249,132	73,751	200,800	7,015	27,141							21,191
41	Utah	66,551	1,065	3,800	13,589	59,587							3,164
42	Vermont	17,008	5,725	16,371	298	512							125
43	Virginia	214,553	30,657	88,630	35,132	108,429							17,494
44	Washington	213,884	70,274	196,251	2,205	6,751							10,882
45	West Virginia	57,309	2,385	5,250	17,031	27,225			9,000	900			23,934
46	Wisconsin	373,361	98,049	257,120	85,418	96,270							19,971
47	Wyoming	3,723	765	3,423	22	50							250
48	All other states	28,512	5,850	28,012									500

TILE, BY STATES AND TERRITORIES: 1890—Continued.

Total value.	PRODUCTS.												
	Common brick.		Fire brick.		Pressed brick.		Vitrified brick.		Paving blocks.		Value of tile.	Value of sewer pipe.	Value of all other products.
	Number of 1,000.	Value.	Number of 1,000.	Value.	Number of 1,000.	Value.	Number of 1,000.	Value.	Number of 1,000.	Value.			
$67,770,695	8,045,282	$48,810,271	363,178	$5,652,564	440,977	$5,973,902	47,520	$490,040	50,825	$492,400	$5,009,804	$287,709	$1,054,005
778,950	97,994	585,080	10,332	161,170	1,520	17,700						10,000	5,000
4,300	600	4,300											
484,885	52,177	353,810	1,000	20,000	755	7,000	11,700	99,000			5,025		50
1,371,654	151,603	1,030,762			8,390	230,292						21,000	89,600
2,023,076	243,683	1,716,849	1,325	32,312	19,454	265,565							8,350
595,200	90,150	540,950	500	21,600	25	500					7,750		15,400
268,534	30,842	230,278			1,500	30,000					8,000		256
846,950	90,430	643,350			11,050	198,600							5,000
119,260	15,965	96,250			3,250	22,600					450		560
1,201,542	191,020	1,098,962	18	230	5,200	97,850					1,000		3,500
9,800	1,012	9,800											
6,399,492	711,884	4,015,945	13,902	182,670	40,235	592,269			18,525	158,400	1,381,403	9,750	59,055
2,829,033	318,429	1,690,611	2,655	39,346	5,125	57,627			500	6,000	1,007,601	12,550	15,298
1,537,890	174,527	1,129,079	458	8,295	4,292	43,537			6,300	64,000	277,853	100	15,026
667,457	88,284	525,029	15	350	6,260	69,827	4,600	55,060			16,391		200
1,011,603	130,896	805,170	2,504	45,072	15,434	125,211					33,400	200	2,550
291,125	41,325	282,625			600	8,500							
511,760	87,065	498,731			780	9,350					3,575		104
1,481,603	141,076	1,069,814	12,495	213,885	7,706	148,617					1,935	1,000	46,352
2,314,406	283,231	1,837,211	4,041	146,245	10,670	199,950					17,500		113,500
1,179,605	202,557	989,793			3,165	28,860					155,377		5,575
1,116,739	203,980	1,089,468	27	695	1,375	21,325					2,080		3,171
295,939	41,629	284,642	20	600	592	8,697							2,000
3,503,906	338,034	1,978,447	27,584	432,818	98,164	925,436	6,000	60,000			75,130		32,075
238,610	27,115	208,910	250	10,000	650	5,200					500	14,000	
2,173,632	227,210	1,610,097	100	2,000	13,704	201,690	15,000	180,000	14,000	145,000	1,700		33,145
789,856	124,602	725,686	3,100	60,000	280	3,650							520
2,826,074	371,938	1,866,507	8,450	209,500	23,477	369,639					175,928	75,000	129,500
6,683,529	1,107,191	5,894,434	8,815	272,350	14,959	266,932					106,323	8,500	134,990
333,150	52,544	293,710	950	13,650	1,689	15,290					4,400	1,500	4,600
45,775	6,300	45,775											
5,813,437	533,238	2,960,466	73,055	1,030,182	28,474	354,101	10,220	95,380	11,500	119,000	1,084,180	121,400	48,728
11,500	1,430	11,500											
461,648	57,845	411,959	20	400	1,300	26,925					20,564	1,800	
9,403,715	805,634	5,547,782	170,177	2,539,633	50,960	923,212					249,133		143,955
265,598	44,864	250,078	45	376	1,125	10,655					3,989		600
134,650	16,000	110,905	73	3,885	1,686	19,860							
1,244,367	182,507	1,050,417	1,000	16,500	10,840	94,700					5,880		76,870
1,214,690	151,090	1,062,830	150	2,000	13,810	122,660					3,150	6,000	18,050
421,658	54,695	396,208	155	7,750	865	17,300							400
89,991	13,800	84,291			150	2,700					3,000		
1,343,598	146,358	1,047,702	10	350	19,957	264,380					19,417	4,909	6,840
1,389,650	162,494	1,293,760	312	9,360	3,409	58,410					570		27,550
249,493	17,605	100,493	17,000	146,000									3,000
1,642,465	191,879	1,171,905	2,640	23,340	8,100	107,885					336,600		2,735
25,900	2,750	25,900											
123,000	17,800	123,000											

TABLE 8.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYÉS AT THE

	STATES AND TERRITORIES.	Number of establishments reporting.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS.												
			Aggregates.		Officers or firm members actively engaged in the industry or in supervision.					Clerks.					
					Males above 16 years.			Females above 15 years.			Males above 16 years.			Females above 15 years.	
			Average number.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.
1	The United States ..	5,828	109,151	$32,695,189	4,197	$20.08	$2,513,617	12	$11.51	$4,800	724	$16.40	$452,646	42	$9.32	$14,769
2	Alabama	59	1,579	350,689	46	21.01	29,586				2	11.67	860			
3	Arizona	3	31	2,600												
4	Arkansas	48	709	167,675	38	23.87	25,442				1	5.13	150			
5	California	52	1,447	628,842	38	28.58	40,249				17	20.91	14,814			
6	Colorado	83	2,254	1,099,513	95	30.68	88,574				14	22.42	11,491	1	20.15	262
7	Connecticut	28	992	317,200	31	25.09	24,168				10	21.85	6,250			
8	Delaware	13	427	143,136	15	28.01	13,566				2	25.51	1,520			
9	District of Columbia	13	1,204	442,929	15	32.88	18,235				7	22.68	7,124			
10	Florida	12	237	60,597	19	13.09	10,155				3	10.01	1,084			
11	Georgia	61	2,080	473,872	54	21.75	41,520				7	14.00	4,900			
12	Idaho	5	38	4,710	3	17.44	510									
13	Illinois	604	9,697	3,216,826	458	19.70	276,073				82	19.14	53,923	4	8.81	1,450
14	Indiana	764	6,137	1,317,120	504	12.94	171,691	2	9.23	600	31	9.88	9,222	1	2.88	150
15	Iowa	260	2,742	707,368	183	14.50	74,637	2	8.75	616	13	9.31	3,367	1	7.38	160
16	Kansas	87	1,280	313,146	48	19.26	26,600				4	11.26	878	2	7.86	443
17	Kentucky	99	1,957	476,845	92	18.81	50,373	1	14.42	375	7	13.67	2,933	2	6.15	440
18	Louisiana	22	540	143,051	20	21.67	15,495				9	12.70	4,512			
19	Maine	118	1,073	279,138	64	17.60	27,082				2	9.77	720			
20	Maryland	64	2,508	681,475	51	24.65	43,130				21	14.73	11,217	1	2.56	50
21	Massachusetts	110	3,261	1,090,450	103	20.80	69,665	2	10.79	795	26	18.66	21,362	1	7.69	400
22	Michigan	185	2,616	538,750	120	14.90	40,221				10	9.91	2,361	1	16.15	350
23	Minnesota	117	2,221	502,183	132	18.10	53,331				16	15.73	6,355			
24	Mississippi	33	666	134,073	24	15.10	10,074				4	9.60	1,560			
25	Missouri	232	4,834	1,706,492	194	25.62	148,944				30	20.93	26,216	5	14.64	3,252
26	Montana	11	252	104,342	8	33.03	6,440									
27	Nebraska	155	2,720	844,850	112	22.44	69,844				21	20.83	14,465	1	5.11	155
28	New Hampshire	62	1,498	342,275	26	21.32	12,564				2	14.57	726			
29	New Jersey	95	4,798	1,529,481	91	21.90	67,686	1	15.00	520	36	16.33	25,821	1	10.26	400
30	New York	275	10,806	3,435,415	208	25.11	161,434	1	12.59	600	60	17.34	42,949	4	9.21	1,168
31	North Carolina	62	1,037	148,110	36	14.63	14,467				5	10.11	1,840			
32	North Dakota	6	80	18,495	2	27.40	950									
33	Ohio	875	9,301	2,649,165	580	16.87	289,229	1	9.23	480	59	15.29	38,389	4	9.23	1,660
34	Oklahoma	3	16	6,684	2	14.80	497									
35	Oregon	47	701	237,773	38	32.36	38,069									
36	Pennsylvania	509	13,612	4,764,392	329	23.30	291,790	2	17.08	814	127	14.60	80,774	8	6.85	2,314
37	South Carolina	39	787	121,238	21	15.16	8,803				2	15.14	1,312			
38	South Dakota	11	219	49,947	14	16.17	5,534									
39	Tennessee	78	2,090	656,806	60	22.48	45,229				18	19.21	14,127			
40	Texas	124	2,040	564,378	69	21.45	46,985				14	17.61	6,390	1	6.41	250
41	Utah	40	758	232,458	27	19.86	14,461				3	17.81	1,640			
42	Vermont	16	197	34,973	7	17.34	2,517									
43	Virginia	88	2,441	607,211	60	18.11	35,726				22	15.61	12,972			
44	Washington	86	1,826	684,461	56	25.27	35,292				4	22.51	2,000	2	12.82	1,000
45	West Virginia	27	403	116,781	15	17.09	9,165							1	4.00	65
46	Wisconsin	137	2,819	680,795	83	22.97	58,970				31	14.28	15,187	1	18.46	800
47	Wyoming	7	31	11,410	2	15.00	390									
48	All other states (a)	3	159	55,069	4	25.89	3,254				2	16.76	1,235			

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Indian territory, 1; Rhode Island, 2.

DIFFERENT WEEKLY RATES OF PAY, BRICK AND TILE, BY STATES AND TERRITORIES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Operatives and skilled.									Unskilled.									Piecework-ers.		
Males above 16 years.			Females above 15 years.			Children.			Males above 16 years.			Females above 15 years.			Children.					
Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Total wages.	
52,749	$10.21	$16,365,497	101	$5.28	$14,810	2,294	$3.65	$251,523	40,865	$8.37	$11,105,863	51	$4.54	$6,806	2,075	$3.63	$223,403	6,041	$1,741,455	1
639	7.63	156,372				92	3.44	13,238	667	6.30	127,633	7	4.31	784	44	2.48	3,558	82	18,658	2
26	14.34	2,470							5	8.00	130									3
274	9.51	79,130				63	4.18	6,775	274	7.33	46,244				2	2.88	300	57	9,634	4
510	13.22	265,727							765	8.97	280,301	1	10.38	360	4	7.24	486	112	26,905	5
1,436	16.56	681,382	2	7.87	480	15	5.69	3,032	566	12.45	259,655	2	3.46	180	40	5.66	6,526	83	47,931	6
502	10.26	140,285							379	9.16	116,463	5	8.02	1,320	5	5.00	650	60	28,064	7
110	13.82	50,150							269	8.12	72,954				17	2.86	1,646	14	3,300	8
795	9.16	319,832				75	5.13	15,000	236	7.68	64,876							76	17,862	9
66	7.30	12,822				11	3.69	1,200	123	5.87	32,251	1	4.04	175	11	4.01	1,910	3	1,000	10
880	7.42	213,345				27	3.69	2,158	936	5.52	190,049				31	1.83	2,425	145	19,475	11
35	12.59	4,200																		12
4,860	10.37	1,586,968	14	4.94	1,989	192	3.54	20,014	3,013	9.28	916,871	2	4.03	192	141	4.49	16,536	931	342,810	13
3,210	7.84	652,284	6	3.53	459	126	3.46	10,666	1,787	7.14	364,578	4	2.75	250	63	2.88	5,423	403	101,797	14
1,490	9.32	361,408				46	2.86	3,483	835	8.58	223,315				25	3.47	1,803	147	38,579	15
684	8.71	155,628	1	4.62	30	46	3.30	3,492	370	8.47	89,089	3	5.00	390	19	4.30	1,957	103	34,639	16
762	9.63	203,802				59	2.84	3,739	747	7.60	160,016				49	3.92	5,513	238	49,654	17
309	7.26	80,198	4	4.04	700	5	1.48	225	138	5.89	29,223				10	2.67	693	45	12,005	18
694	10.22	163,008	2	9.69	714	2	2.88	125	229	8.45	50,997				2	2.88	175	78	36,317	19
917	8.77	290,157				20	2.77	1,461	876	7 31	214,425				47	3.25	5,348	575	115,687	20
2,125	9.91	698,431	3	6.46	630				896	9.15	265,508							105	33,659	21
1,464	9.01	298,508	7	6.95	1,295	26	3.21	1,552	911	8.04	179,877	1	5.31	138	16	4.01	1,668	60	12,780	22
986	10.58	238,553	6	4.02	383	15	4.15	1,381	972	8.91	190,032	1	2.31	60	66	3.12	5,208	27	6,880	23
265	7.98	58,208				27	2.41	1,715	298	5.71	48,724				18	3.03	1,392	60	12,400	24
1,903	11.36	727,429	3	2.95	230	153	4.16	24,305	2,032	8.98	645,321				183	3.93	23,021	331	107,774	25
133	17.88	59,468							97	16.00	32,334				2	2.01	100	12	6,000	26
983	11.49	325,236	2	4.09	133	56	5.13	9,323	1,394	9.77	401,371	2	6.00	364	89	4.56	10,779	60	13,180	27
926	9.82	216,760	2	5.54	264	1	3.78	90	541	8.84	111,871									28
1,666	11.70	680,906				59	3.42	6,330	2,754	7.33	703,738				72	2.67	6,183	118	37,897	29
4,965	10.69	1,607,743	11	6.16	1,816	82	4.39	11,673	5,295	9.83	1,576,370	8	2.63	622	124	3.69	13,788	48	17,252	30
501	5.61	73,307				56	2.17	2,996	401	4.33	52,603	1	2.88	100	34	2.06	2,725	3	72	31
57	12.01	12,855							21	11.64	4,690									32
5,208	9.20	1,461,081	5	2.86	365	188	3.49	16,476	2,398	7.73	646,663	3	1.95	148	144	3.37	14,197	711	180,477	33
13	12.74	6,100							1	8.03	87									34
310	13.03	99,561				10	5.34	763	339	10.06	99,040				2	5.00	260	2	80	35
6,576	10.87	2,523,859	20	5.74	4,136	548	3.71	67,109	4,497	8.03	1,405,682				467	3.95	60,959	1,038	326,955	36
381	5.98	56,655				40	3.30	3,325	317	4.72	50,175				24	2.04	903	2	65	37
87	9.81	20,112							118	7.86	24,301									38
690	10.36	239,209				38	2.36	2,189	1,098	7.95	339,391	8	4.75	1,483	134	3.24	11,145	44	4,033	39
1,171	9.10	307,785				32	2.79	3,185	643	7.84	172,876	1	5.77	150	27	4.80	4,126	82	22,631	40
458	14.39	146,070				31	5.68	4,551	180	11.73	53,380				32	5.06	2,724	27	9,632	41
96	8.96	19,586							88	7.18	12,420				6	4.51	450			42
996	8.04	253,481				67	2.17	3,898	1,145	7.07	289,442				70	2.70	4,360	81	13,332	43
1,007	15.07	384,953	6	6.31	636	13	2.80	808	709	12.83	246,307	1	10.38	90	5	4.53	363	23	13,012	44
189	8.88	64,607				26	3.24	2,820	155	7.30	36,391				8	3.06	993	9	2,740	45
1,343	9.65	346,054	7	3.10	550	43	2.19	2,226	1,225	7.61	243,011				42	2.89	3,110	44	15,887	46
25	12.29	9,770							4	12.02	1,250									47
26	13.96	10,042				4	2.88	200	121	12.19	39,938							2	400	48

TABLE 8.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYES AT THE

	STATES AND TERRITORIES.	AVERAGE NUMBER OF HOURS IN ORDINARY DAY OF LABOR.		WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)											
				Males above 16 years.											
		May to November.	November to May.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.
1	The United States	9.92	9.56	98,535	5,564	5,309	9,621	13,383	10,089	17,656	15,668	11,192	6,753	1,971	1,329
2	Alabama	10.20	9.95	1,354	243	187	409	257	47	63	33	50	33	14	18
3	Arizona	9.33	9.33	31	.....	.....	.....	5	.....	8	.....	.....	3	15	.....
4	Arkansas	10.04	9.97	587	12	58	95	63	104	137	27	30	41	9	11
5	California	9.66	9.49	1,330	9	8	202	66	36	180	249	407	105	33	35
6	Colorado	8.72	8.62	2,111	2	1	.....	23	11	36	286	475	1,008	130	139
7	Connecticut	10.16	9.88	922	6	32	12	19	78	402	269	47	27	16	14
8	Delaware	9.69	9.60	396	.....	10	9	129	69	54	41	27	39	6	12
9	District of Columbia	9.31	9.17	1,053	15	28	55	324	44	132	205	213	21	9	7
10	Florida	10.00	9.92	211	16	52	70	30	8	9	12	4	10	.....	.....
11	Georgia	10.34	9.68	1,877	529	309	399	156	201	53	137	34	28	13	18
12	Idaho	9.60	9.33	38	.....	.....	.....	.....	5	6	1	8	13	5	.....
13	Illinois	9.58	9.49	8,413	231	305	530	1,326	814	1,650	1,154	1,480	588	206	129
14	Indiana	9.89	9.69	5,532	498	524	849	1,219	709	680	522	304	144	66	17
15	Iowa	9.97	9.58	2,521	105	138	139	411	402	602	404	161	112	35	12
16	Kansas	9.72	9.62	1,106	117	55	96	149	115	239	130	89	71	17	8
17	Kentucky	9.49	9.15	1,608	121	85	333	243	78	359	137	141	62	22	27
18	Louisiana	10.07	9.86	476	27	72	154	123	21	33	11	11	13	3	8
19	Maine	11.27	9.83	989	37	16	47	116	143	127	218	215	47	15	8
20	Maryland	9.52	9.33	1,865	68	83	307	594	227	252	147	83	76	8	20
21	Massachusetts	10.80	10.23	3,150	12	81	280	197	324	890	853	210	206	62	35
22	Michigan	10.02	9.49	2,505	94	110	239	555	228	728	330	126	62	25	8
23	Minnesota	10.22	9.66	2,106	10	69	123	196	213	736	329	233	28	52	22
24	Mississippi	9.77	9.81	591	74	109	168	80	71	27	30	16	12	1	3
25	Missouri	9.36	9.50	4,159	144	158	264	449	393	1,158	851	273	285	90	94
26	Montana	9.64	9.83	238	.....	.....	.....	.....	.....	.....	17	40	137	34	10
27	Nebraska	9.69	9.40	2,510	32	14	57	144	224	688	777	284	185	53	52
28	New Hampshire	11.54	10.89	1,495	10	59	117	160	283	368	298	84	63	42	11
29	New Jersey	10.37	10.08	4,547	375	136	365	1,042	561	444	774	512	237	77	24
30	New York	10.42	9.41	10,528	178	344	511	752	807	2,042	3,215	1,818	498	204	159
31	North Carolina	10.31	9.61	943	521	180	74	41	26	45	19	21	6	8	2
32	North Dakota	10.00	.....	80	.....	2	4	5	7	14	16	15	4	12	1
33	Ohio	10.04	9.69	8,245	394	464	1,075	1,585	1,031	1,508	764	812	413	112	87
34	Oklahoma	10.00	10.00	16	.....	.....	.....	.....	7	1	.....	3	1	4	.....
35	Oregon	9.77	9.80	687	18	9	10	27	82	51	254	133	61	27	15
36	Pennsylvania	9.52	9.21	11,529	509	826	776	1,244	1,439	1,890	2,145	1,386	944	229	141
37	South Carolina	10.58	9.67	721	407	110	91	31	18	24	14	17	3	5	1
38	South Dakota	10.00	9.50	219	1	2	37	1	51	98	15	4	6	4	.....
39	Tennessee	9.99	10.07	1,866	184	199	556	135	119	193	114	89	193	57	27
40	Texas	9.65	9.27	1,897	141	112	118	340	249	568	107	149	56	26	31
41	Utah	9.46	9.55	668	3	12	14	25	5	56	44	247	197	45	10
42	Vermont	10.44	10.50	191	17	.....	27	50	37	33	7	7	9	2	2
43	Virginia	10.07	9.70	2,223	211	194	744	392	266	145	71	85	76	20	19
44	Washington	9.97	9.65	1,776	3	10	25	11	107	120	360	573	400	111	56
45	West Virginia	9.78	9.62	359	52	14	47	52	69	50	31	21	18	2	3
46	Wisconsin	10.04	9.77	2,682	138	132	193	615	350	729	233	127	92	43	30
47	Wyoming	10.00	9.00	31	.....	.....	.....	.....	5	4	4	9	9	.....	.....
48	All other states	10.00	9.33	153	.....	.....	.....	1	.....	4	13	119	11	2	3

a In comparing the weekly rates of wages and the number of employés at each rate with the average weekly earnings presented in the first part of this table it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for the employés at the respective rates.

DIFFERENT WEEKLY RATES OF PAY, BRICK AND TILE, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Females above 15 years.											Children.					
Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over.	
206	103	21	17	11	14	8	16	8	5	3	4,369	3,406	589	222	152	1
7	7										136	124		12		2
																3
											65	51	2	12		4
1							1				4	2			2	5
5	2			2						1	55	15	9	28	3	6
5			1	2	1	1					5		5			7
											17	17				8
											75		75			9
1	1										22	22				10
											58	57	1			11
																12
20	10	5	2				3				333	229	67	9	28	13
13	10	1			1		1				189	157	20	6	6	14
3				2			1				71	63	3		5	15
6	1	3	1			1					65	57	3	5		16
3	1				1			1			108	105	3			17
4	4										15	15				18
2	1							1			4	4				19
1	1										67	67				20
6		1		3		1	1									21
9	1	1	1		5				1		42	30	5	7		22
7	7										81	68	7	5	1	23
											45	45				24
8	2	1				1	1	1	1	1	336	275	53		8	25
											2	2				26
5	1	2	2								145	61	49	29	6	27
2		1	1								1	1				28
2							1		1		131	118	7	3	3	29
24	13	3		1			4	3			206	136	36	10	24	30
1	1										90	90				31
																32
13	7	1	1			2	1	1			332	299	29	1	3	33
																34
											12	3	9			35
30	15	1	5		5	1	1	1		1	1,015	719	167	81	48	36
											64	62	2			37
																38
8	8										172	162	10			39
2		1	1								59	50		9		40
											63	20	23	5	15	41
											6	6				42
											137	137				43
9	2		2	1	1	1	1		1		18	18				44
1	1										34	33	1			45
8	7								1		85	82	3			46
																47
											4	4				48

SHIPBUILDING.

SHIPBUILDING.

The tabular statements presented herewith include reports made by establishments whose principal products consisted of the building or repairing of iron, steel, or wooden sail or steam ships, barges, canal or other boats, masts, or spars. The year covered by the report is the census year ending May 31, 1890.

The returns have been tabulated and are presented in this report under 4 subtitles: (1) "Building of iron and steel vessels"; (2) "Building of wooden vessels"; (3) "Building of boats, masts, and spars", and (4) "Repairing of vessels". The data for the entire industry and for the 4 branches are summarized as follows:

SHIPBUILDING IN THE AGGREGATE AND BY SUBDIVISIONS: 1890.

ITEMS.	Aggregate.	Iron and steel vessels.	Wooden vessels.	Boats, masts, and spars.	Repairing of vessels.
Number of establishments reporting	1,010	21	259	503	227
Capital, direct investment	$53,393,074	$33,900,148	$8,928,851	$5,131,857	$5,432,218
Miscellaneous expenses	$1,392,551	$546,135	$482,377	$110,129	$253,910
Average number of employés (aggregate)	25,934	10,767	8,173	2,196	4,798
Total wages	$16,028,847	$6,579,063	$4,645,679	$1,391,155	$3,412,950
Officers, firm members, and clerks:					
Average number	1,123	138	322	413	250
Total wages	$1,194,870	$291,105	$313,328	$300,915	$289,522
All other employés:					
Average number	24,811	10,629	7,851	1,783	4,548
Total wages	$14,833,977	$6,287,958	$4,332,351	$1,090,240	$3,123,428
Cost of materials used	$16,925,109	$6,637,425	$6,582,032	$1,151,768	$2,553,884
Value of products	$40,342,115	$15,206,658	$14,218,099	$3,161,526	$7,755,832

The reports have been assigned to the 4 branches of shipbuilding according to the product of chief value shown by each return; therefore, the totals given for the respective branches do not represent the full value of the products of each branch. For instance, the presentation for the subdivision entitled "Repairing of vessels" falls short of the total value of such repairs by the value of vessel repairs made in establishments included in the other 3 classes. It may also happen that establishments reported elsewhere in the general report on manufactures, under the heads of "Foundry and machine shop products" or "Carpentering", and similar productive industries, build or repair vessels; such work being incidental, is included in the report for the establishment which is tabulated in its proper class.

The subdivision "Iron and steel vessels" includes the building of iron and steel steam or sail vessels and barges; "Wooden vessels" includes the building of wooden, steam, or sail vessels, barges, and canal boats; "Boats, masts, and spars" includes the building of ships' boats, fishing boats, pleasure boats, and lifeboats, also the manufacture of masts and spars; "Repairing" includes returns from all establishments whose principal product consists of repairing, irrespective of the character of the vessel or boat.

Returns too imperfect for tabulation were received from a few shipbuilders. It is believed that the omission of the reports from the delinquent establishments has but slight effect on the totals for the United States. The principal omission occurs in the state of Pennsylvania.

Owing to differences in the forms of inquiry and in the method of collection and classification, it is not practicable to make true comparisons of the data reported in answer to all the questions used at the censuses of 1880 and 1890. The statistics for 1890 include the operations of the United States navy yards located in Brooklyn, N. Y., Mare Island, Cal., Norfolk, Va., and Portsmouth, N. H. The statistics for these navy yards are shown in the statement on the following page.

...STRIES.

...ILDING: 1890.

...		4
...		$26,130,182
...		2,668
...		$1,750,028
...		$403,863
...	13	
...	24,956	
...		$1,705,857
...	50	
...		50,000
...		20,000
...		500,848
...		2,276,705

...statement include in some instances capital and expenses that do not

...vy yards were not included in the report for 1880; therefore they are ...owing comparative summary:

...SUMMARY, SHIPBUILDING: 1880 AND 1890.

ITEMS.	1880	1890
...	2,188	1,006
...	$20,979,874	$27,262,892
...	(a)	$1,392,551
... aggregate)	21,345	23,266
...	$12,713,813	$14,278,819
... and clerks:		
...	(b)	1,123
...	(b)	$1,194,870
...		
...	(b)	22,143
...	(b)	$13,083,949
...	$19,736,358	$16,521,216
...	$36,800,327	$58,065,410

a Not reported. b Not reported separately.

...there has been a decrease of 1,182 in the number of establishments, while the ... industry has increased $6,283,018, or 29.95 per cent, since 1880. The concentration of the ... decrease of 136.99 per cent in the average number of employés per establishment as ... output from 1,006 establishments in 1890 exceeds that from 2,188 establishments in

... did not specify the kind of tonnage to be reported, therefore registered, gross, and ... indiscriminately, and can not be separated. Taking the figures as reported in Table 1, it ... tonnage per vessel built and the average value per ton were as follows at the censuses of

...TONNAGE PER VESSEL AND AVERAGE VALUE PER TON, SHIPBUILDING: 1880 AND 1890.

CLASSES.	AVERAGE TONNAGE PER VESSEL.		AVERAGE VALUE PER TON.	
	1880	1890	1880	1890
Iron and steel vessels	467.87	1,408.78	$162.58	$93.17
Wooden vessels	235.09	321.97	30.91	38.80
Canal boats	103.74	149.29	26.08	12.50

The number of iron and steel vessels built has increased from 67 to 88, while the average tonnage per vessel has increased 940.91 tons. The number of wooden vessels built has decreased from 1,705 to 995, and the average tonnage per vessel increased 86.88 tons. A decrease of 373 appears in the number of canal boats built, while the increase in the average tonnage per vessel is 45.55 tons.

A great increase appears for the boat building industry, the number built in 1890 being 18,689, valued at $1,392,084, an average of $74.49 for each boat, as compared with 8,026 boats valued at $876,999, an average of $109.27 at the census of 1880.

In comparing the quantities reported in Table 1, presenting the various classes of materials used, the fact should be noted that the quantity of iron and steel stated for 1890 does not include the weight of boilers and machinery.

The quantity of lumber used has increased from 179,873,966 feet to 191,574,429 feet, or 6.50 per cent, the increase occurring in hard pine and varieties included in the column "All other lumber", the quantity of white pine and oak showing a decrease.

The proportionate cost of materials of the total value of product was 53.63 per cent in 1880 and 43.40 per cent in 1890.

The results of the differences in the form of inquiry previously referred to are most apparent in the statistics of capital and employés and wages. The form of question used at the census of 1880 respecting capital was as follows: "Capital (real and personal) invested in the business". The census inquiry of 1890 was more in detail, and comprehended all the property or assets strictly pertaining to a manufacturing business, whether such property was owned, borrowed, or hired.

The totals for the various subheads into which the inquiry of 1890 is divided are given in the following statement, with the proportion the amount reported for each is of the $53,393,074 capital directly invested in the entire industry:

ITEMS OF CAPITAL, DIRECT INVESTMENT, AND PERCENTAGE FOR EACH OF THE CORRESPONDING TOTALS, SHIPBUILDING: 1890.

ITEMS.	Amount of capital, direct investment.	Per cent of total capital of direct investment.
Capital, direct investment, aggregate	$53,393,074	$100.00
Plant, total value	39,870,605	74.67
Land	14,294,878	26.77
Buildings	10,170,301	19.05
Machinery, tools, and implements	15,405,486	28.85
Live assets, total value	13,522,409	25.33
Raw materials	2,469,018	4.63
Stock in process	3,116,265	5.84
Finished products on hand	1,876,033	3.51
Cash, bills and accounts receivable, and sundries not elsewhere reported.	6,061,093	11.35

In order to obtain the aggregate amount of capital employed in the industry it is necessary to add to the amount of direct investment shown in the foregoing statement the value of property used in the business but held in tenancy; the value of such hired property used in the shipbuilding industry is ascertained to be $2,950,055, which makes a total capital of $56,343,129. Statistics concerning the capital invested in the different branches of the industry will be found in Tables 3, 4, 5, and 6 accompanying this report.

The questions respecting employés and wages used at the Tenth Census called only for "The greatest number of hands employed at any one time during the year", also "The average number of hands employed", classified as males above 16 years, females above 15 years, and children, with the total amount of wages paid during the year. The form of inquiry used at the Eleventh Census was as follows: (1) "Operatives, engineers, and other skilled workmen, overseers, foremen, or superintendents (not general superintendents or managers)"; (2) "Officers or firm members"; (3) "Clerks"; (4) "Watchmen, laborers, teamsters, and other unskilled workmen"; (5) "Pieceworkers", not included in the foregoing. The questions required a statement of the average number of males above 16 years, females above 15 years, and children, respectively, employed during the year in each class; also the actual amount of wages paid to each number. A statement was also required showing the various rates of wages per week, the average number of males, females, and children, respectively, employed at each rate exclusive of those reported as employed on piecework, and the actual term of operation for the establishment reporting.

The wage statistics compiled from the reports obtained are stated in detail in Table 7.

In Table 2 the 5 classes of employés which have been described are grouped, "Officers, firm members, and clerks" constituting 1 group. In this group there are 1,123 employés, or 4.33 per cent of the total number, receiving $1,194,870 wages, or 7.45 per cent of the total wages. All other employés receiving wages according to time are shown in the second group; of these there are 23,680, or 91.31 per cent of the total number, receiving $14,241,585 in wages, or 88.85 per cent of the total. Those operatives paid by the piece or according to quantity of production are shown in the third group; of these there are 1,131, or 4.36 per cent of the total, to whom $592,392 was paid as wages, or 3.70 per cent of the total wages.

At the census of 1880, 21,338 male employés were reported for the shipbuilding industry, constituting 99.97 per cent of all employés, as compared with 25,740, or 99.25 per cent of the total reported for 1890, which includes United States navy yards. While no females are reported for 1880, there are 20 shown for 1890. Of these 1 is reported as an officer or firm member, 10 as clerks, 7 as skilled employés, and 2 as pieceworkers. In 1880, 7 children were reported, as compared with 174 for 1890.

The following statement shows the average number of males above 16 years, females above 15 years, and children, including officers, firm members, and clerks, but not pieceworkers, reported for the entire industry, distributed at specified weekly rates of wages:

AVERAGE NUMBER OF MALES, FEMALES, AND CHILDREN, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT PIECEWORKERS, EMPLOYED AT SPECIFIED WEEKLY RATES OF WAGES, SHIPBUILDING: 1890.

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	24,611	18	174
Under $5	595	1	169
$5 and over but under $6	359	3	5
$6 and over but under $7	567	5	.....
$7 and over but under $8	1,482	3	.....
$8 and over but under $9	1,538	2	.....
$9 and over but under $10	2,362	1	.....
$10 and over but under $12	3,060	.....	.....
$12 and over but under $15	5,330	2	.....
$15 and over but under $20	7,178	.....	.....
$20 and over but under $25	1,595	.....	.....
$25 and over	544	1	.....

No preceding census inquiry has comprehended data relating to cost of manufacture other than statistics of wages and materials.

The inquiry at the Eleventh Census was designed to embrace the entire cost of production other than allowance for depreciation of plant and interest on capital. To enable such a presentation to be made a series of questions pertaining to miscellaneous expenses were included in the schedule of inquiry. The data furnished in answer to these questions are given in detail in Table 2.

The difference between the cost and the value shown must not be taken as indicating the net profit or earnings for capital, because these statistics contain no information relative to cost of selling, mercantile losses, or depreciation of plant. The census inquiry was intended simply to ascertain the relation which capital, expenses, wages, and cost of materials bear to the value at the works of the products of manufacturing industry, excluding all cost or expense pertaining to the mercantile portion of the business.

In Tables 3, 4, 5, and 6 the data reported by shipbuilding establishments are distributed to the 4 branches of the industry according to the value of the principal products.

The proportion in the whole industry of the data for each branch under the principal heads of the inquiry used at the Eleventh Census is shown in the following statement:

PERCENTAGE THE SEVERAL ITEMS REPORTED FOR EACH BRANCH OF SHIPBUILDING IS OF THE TOTALS OF THE CORRESPONDING ITEMS FOR THE ENTIRE INDUSTRY: 1890.

ITEMS.	Iron and steel vessels.	Wooden vessels	Boats, masts, and spars.	Repairing of vessels.
Capital, direct investment	63.49	16.72	9.61	10.18
Miscellaneous expenses	39.22	34.64	7.91	18.23
Average number of employés	41.52	31.51	8.47	18.50
Total wages	41.05	28.98	8.68	21.29
Cost of materials used	39.22	38.89	6.80	15.09
Value of products	37.69	35.24	7.84	19.23

MATERIALS USED.

The book accounts kept by most shipbuilders do not readily show the quantity or the cost of each class of material as called for by the census schedule, so that the classified data shown in Table 2 should only be accepted as indicating in a general way the relative quantity and cost of the respective classes of materials, as compared with the total cost of all materials used.

This relative cost is indicated by a distribution by amount and percentage of the principal classes, as follows:

COST OF DIFFERENT MATERIALS AND THEIR PERCENTAGES OF COST OF ALL MATERIALS, SHIPBUILDING: 1890.

ITEMS.	Cost.	Percentage of total cost.
Total cost of all materials	$16,925,109	100.00
Lumber, including wooden knees	5,995,894	35.43
Metal	4,872,074	28.79
Boilers and machinery	2,913,856	17.22
Cordage	309,270	1.83
Blocks	74,927	0.44
Duck	141,319	0.83
Painting	332,690	1.96
Oakum and pitch	227,994	1.35
Masts and spars (not made in yard)	204,365	1.21
Fittings and furniture (not made in yard)	461,245	2.72
All other materials	1,391,475	8.22

Table 1, appended, is a comparative statement of the shipbuilding industry in entirety by states and territories for the census years 1880 and 1890. Table 2 is a detailed statement showing the statistics for the entire industry as reported at the census of 1890. Tables 3, 4, 5, and 6 present the statistics for the 4 branches of shipbuilding, separately and in the following order: (1) "Iron and steel vessels"; (2) "Wooden vessels"; (3) "Boats, masts, and spars"; (4) "Repairing". As previously explained, the reports have been assigned to the different classes according to the product of chief value shown by each return; therefore the totals for the respective classes do not represent the full value of the product of each class.

Table 7 is a presentation of the statistics of employés and wages for the entire industry. It shows the employés classified as (1) "Officers and firm members"; (2) "Clerks"; (3) "Operatives and skilled"; (4) "Unskilled", and their further division by "Males above 16 years", "Females above 15 years", and "Children", with the total wages paid to each class and the average weekly earnings per employé by state totals. It also shows the average number of pieceworkers and their total wages, and finally the weekly rates of wages paid and the average number of employés, males, females, and children at each rate, not including pieceworkers. The number of employés reported is the average number employed during the year, that is, the average number having continuous employment for the full time reported by individual establishments. Upon this basis the computations are made to obtain the "Average weekly earnings". The average number of employés reported for each establishment is multiplied by the number of weeks the establishment was in operation; the result is the number of weeks required for 1 employé to perform the labor. Aggregating such results of individual reports, the number of weeks required for 1 employé to perform the entire labor is obtained. This number, used as a divisor for the total wages reported, produces the true average weekly earnings.

TABLE 1.—COMPARATIVE STATEMENT, SHIPBUILDING, BY STATES AND TERRITORIES: 1880 AND 1890.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital (a)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Total cost of all materials.	QUANTITIES OF PRINCIPAL MATERIALS USED.		
				Employés.	Wages		Iron and steel. (b) (Pounds.)	Yellow metal and brass. (Pounds.)	Duck. (Yards.)
The United States	1880	2,188	$20,979,874	21,345	$12,713,813	$19,736,358	125,701,922	7,669,826	4,684,464
	c1890	1,006	27,262,892	23,266	14,278,819	16,521,246	147,954,761	2,999,289	641,791
Arkansas	1880	3	2,500	25	3,600	21,700	176,000	3,100	700
	d1890	.....	.....	.....	.....	.....	.....	.....	.....
California	1880	62	1,806,923	534	589,564	959,349	2,092,656	1,058,730	151,453
	1890	32	1,953,198	1,482	1,213,989	1,212,671	9,510,000	1,140,368	47,782
Connecticut	1880	94	334,300	500	256,849	430,425	1,042,156	60,800	85,870
	1890	29	564,941	652	376,122	535,093	2,342,000	66,550	69,235
Delaware	1880	18	935,200	1,576	900,322	964,275	13,045,744	135,866	65,602
	1890	11	1,745,213	1,802	899,151	836,979	9,894,000	16,050	25,035
District of Columbia	e1880	.....	.....	.....	.....	.....	.....	.....	.....
	1890	4	15,575	14	8,410	9,940	44,000	500	500
Florida	1880	48	30,750	46	33,580	43,250	138,160	800	19,520
	1890	16	93,156	76	33,621	21,702	80,000	4,235	2,325
Georgia	1880	2	3,000	4	2,250	13,700	90,000	1,200	550
	1890	4	156,100	118	61,134	45,716	140,000	4,000	.....
Illinois	1880	28	457,000	465	247,395	492,010	1,130,400	7,250	761,350
	1890	10	638,439	331	187,021	148,127	414,000	10,000	100
Indiana	1880	23	194,250	312	211,736	529,840	3,173,600	47,900	28,800
	1890	11	371,860	551	253,733	204,229	1,322,000	.....	23,000
Iowa	1880	1	25,000	75	37,000	62,000	139,000	4,000	1,600
	1890	5	38,850	48	26,926	22,820	10,000	5,000	307
Kentucky	1880	11	88,450	157	92,171	126,550	569,699	3,700	2,250
	1890	29	53,511	88	41,577	31,675	174,000	8,000	2,900
Louisiana	1890	38	152,100	218	113,526	162,405	362,230	5,100	85,030
	1880	13	368,218	192	119,555	71,259	209,000	76,600	200
Maine	1880	379	811,750	1,967	838,559	1,935,857	9,981,416	467,956	601,298
	1890	85	1,027,756	1,539	843,715	1,423,175	6,873,000	117,883	181,949
Maryland	1880	166	1,606,535	1,178	657,789	884,299	3,299,358	514,554	408,940
	1890	34	1,315,262	1,075	649,342	737,457	2,274,000	54,100	4,100
Massachusetts	1880	276	1,765,450	1,328	804,571	1,173,640	2,955,965	1,044,611	423,275
	1890	147	1,239,998	1,188	865,928	890,405	3,252,000	132,725	45,941
Michigan	1880	72	476,775	1,537	745,933	1,089,985	9,479,730	48,300	147,776
	1890	62	3,266,472	2,284	1,267,102	2,300,299	21,415,500	15,775	61,326
Minnesota	1880	1	10,000	16	8,000	2,500	.....	.....	.....
	1890	20	521,373	319	178,608	322,412	8,486,000	300	7,419
Mississippi	1880	3	2,500	4	2,860	1,950	11,600	.....	610
	1890	9	8,554	47	15,742	7,495	28,000	.....	.....
Missouri	1880	14	247,900	293	196,005	313,392	2,421,260	8,000	4,600
	1890	5	125,625	357	159,224	145,707	1,676,000	.....	250
New Hampshire	1880	15	15,330	26	12,243	14,369	19,300	.....	10,900
	f1890	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	1880	93	943,070	930	548,807	649,194	2,455,048	211,958	87,940
	1890	62	2,165,104	1,186	890,789	1,140,452	4,770,000	287,750	32,102
New York	1880	457	3,944,100	4,661	2,907,129	4,055,637	16,292,176	3,072,264	811,130
	1890	216	4,281,884	3,538	2,615,756	2,267,391	16,039,000	486,108	43,108
North Carolina	1880	11	15,400	38	19,256	32,075	124,400	2,600	1,300
	1890	16	76,978	138	50,484	30,396	276,000	10,300	3,400
Ohio	1880	54	423,050	773	414,360	985,960	7,635,020	74,900	157,750
	1890	44	2,950,811	2,822	1,521,212	1,750,939	30,448,000	53,850	18,584
Oregon	1880	14	63,300	85	77,150	124,400	420,700	5,200	3,210
	1890	14	305,220	208	135,222	119,036	214,000	1,950	10,700
Pennsylvania	1880	125	5,797,731	3,298	2,279,629	3,610,367	43,810,621	763,487	639,580
	1890	32	2,443,063	2,022	1,215,876	1,750,582	25,407,000	454,820	50,480
Rhode Island	1880	22	227,700	318	194,662	266,858	952,058	65,000	4,100
	1890	15	316,665	200	133,453	68,900	224,000	9,220	3,790
South Carolina	1880	16	46,300	94	55,990	55,250	220,600	900	16,080
	1890	8	128,020	83	47,286	46,752	502,000	30,450	.....
Texas	1880	16	23,350	43	30,170	40,340	129,500	14,750	8,180
	1890	9	9,619	31	11,788	12,808	41,500	40	400

a Value of hired property is not included in the capital reported for 1890, because it was not included in the report for 1880.
b Figures for 1890 do not include weight of boiler and machinery.
c For purposes of comparison the reports of the United States navy yards, located in Brooklyn, N. Y.; Mare Island, Cal.; Norfolk, Va., and Portsmouth, N. H., are not included in the figures for 1890, as the operations of United States navy yards were not included in the report for 1880.
d See note b at end of table.
e None reported in 1880.
f None reported in 1890.

TABLE 1.—COMPARATIVE STATEMENT, SHIPBUILDING, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	QUANTITIES OF PRINCIPAL MATERIALS USED—continued.							
		Manilla rope. (Pounds.)	Hemp cordage. (Pounds.)	Knees. (Number.)	Lumber				
					Total (Feet.)	Hard pine (Feet.)	White pine. (Feet.)	White oak (Feet.)	All other kinds (Feet.)
The United States	1880	1,996,163	1,125,131	97,192	179,873,966	39,327,372	47,506,048	69,701,360	23,339,186
	1890	1,077,045	412,283	79,725	191,574,429	61,694,253	24,571,343	57,706,487	47,602,346
Arkansas	1880	900	.....	.....	171,000	32,000	24,000	115,000	.....
	1890	.....	.....	.....	.....	.....	.....	.....	.....
California	1880	73,840	36,880	1,621	6,580,000	.....	.....	196,000	6,384,000
	1890	89,768	2,000	2,784	7,913,485	4,353,146	390,470	72,291	3,097,578
Connecticut	1880	38,981	41,142	3,320	4,793,450	2,777,000	604,080	722,900	689,470
	1890	58,757	22,174	6,445	10,700,688	6,381,900	545,200	1,611,600	2,161,988
Delaware	1880	67,097	74,804	4,651	6,411,800	1,966,500	1,886,500	2,217,800	341,000
	1890	41,710	31,360	1,570	4,457,911	1,984,597	945,049	968,660	559,605
District of Columbia	1880	.....	.....	.....	.....	.....	.....	.....	.....
	1890	.....	.....	30	184,330	137,730	22,000	14,000	10,600
Florida	1880	6,530	200	.....	176,400	95,100	.....	38,800	42,500
	1890	4,360	1,225	460	583,700	426,000	10,300	11,000	136,400
Georgia	1880	750	.....	.....	117,000	95,000	8,300	14,000	.....
	1890	250	1,000	1,701	743,600	552,000	30,000	44,000	117,600
Illinois	1880	2,580	.....	45	5,137,300	.....	1,234,500	3,631,800	271,000
	1890	200	.....	575	2,347,158	.....	388,710	1,476,048	482,400
Indiana	1880	36,300	.....	.....	7,046,400	.....	1,569,100	4,878,300	599,000
	1890	21,000	700	315	5,675,700	1,116,000	603,300	1,371,400	2,585,000
Iowa	1880	1,250	.....	.....	460,000	.....	160,000	300,000	.....
	1890	.....	.....	.....	511,955	8,000	302,611	120,176	81,168
Kentucky	1880	2,350	.....	.....	3,291,000	2,500	1,352,500	1,451,000	485,000
	1890	420	3,500	.....	718,750	.....	182,500	337,500	198,750
Louisiana	1880	7,120	680	40	423,600	233,100	.....	72,500	118,000
	1890	1,200	1,545	734	1,247,042	785,820	.....	157,874	303,348
Maine	1880	446,862	373,712	26,560	25,866,351	13,882,112	3,064,208	5,193,710	3,726,321
	1890	273,289	134,234	20,405	27,130,029	15,820,822	2,236,891	3,495,990	5,576,326
Maryland	1880	118,920	151,600	3,440	10,536,400	4,596,700	3,430,200	2,376,500	133,000
	1890	2,000	1,100	2,420	6,050,220	2,318,000	665,700	1,503,600	1,562,920
Massachusetts	1880	94,235	125,000	8,750	6,958,745	2,197,760	2,065,860	1,877,650	817,475
	1890	65,626	11,815	9,432	16,507,747	4,389,690	2,448,289	2,238,092	7,431,676
Michigan	1880	84,320	19,650	6,383	8,636,200	.....	2,482,600	6,122,600	31,000
	1890	195,561	4,000	7,888	26,243,023	1,026,000	2,806,082	21,206,058	1,204,883
Minnesota	1880	.....	.....	.....	.....	.....	.....	.....	.....
	1890	27,588	1,000	185	1,147,800	455,100	243,000	294,600	155,100
Mississippi	1880	430	150	.....	19,000	9,000	.....	8,000	2,000
	1890	120	.....	240	297,700	221,900	.....	1,000	74,800
Missouri	1880	4,150	.....	.....	3,336,500	.....	978,000	2,165,500	193,000
	1890	.....	.....	.....	2,847,800	150,000	602,200	2,000,000	95,600
New Hampshire	1880	.....	.....	70	74,000	10,000	39,600	16,400	8,000
	a1890	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	1880	47,687	58,316	5,620	6,279,900	1,827,800	1,665,300	2,274,300	512,500
	1890	101,185	144,055	4,788	14,321,420	6,676,595	1,710,411	2,686,000	3,248,414
New York	1880	267,121	34,477	23,103	35,905,020	7,652,800	10,461,000	14,535,900	3,255,320
	1890	14,222	3,975	9,888	32,488,646	10,241,862	5,396,976	7,013,004	9,836,804
North Carolina	1880	1,560	.....	310	270,000	232,000	13,000	25,000	.....
	1890	530	1,450	410	957,475	568,000	9,000	92,000	288,475
Ohio	1880	100,350	16,300	2,518	10,166,500	40,000	1,937,000	7,793,500	396,000
	1890	60,350	550	1,380	10,421,433	558,000	2,120,687	5,694,546	2,048,200
Oregon	1880	8,500	2,080	125	836,000	.....	.....	12,500	823,500
	1890	5,000	10,000	2,620	2,798,050	.....	312,500	292,150	2,193,400
Pennsylvania	1880	523,520	162,400	6,055	24,321,600	2,099,300	10,960,800	7,908,900	3,352,600
	1890	90,731	770	1,140	5,020,773	805,869	1,689,559	1,202,854	1,322,491
Rhode Island	1880	5,400	.....	1,330	726,900	185,000	178,300	190,600	173,000
	1890	6,553	.....	590	419,595	105,700	78,350	98,175	137,370
South Carolina	1880	2,810	.....	436	680,100	584,600	10,400	40,100	45,000
	1890	6,700	.....	770	1,173,000	994,500	22,000	65,000	91,500
Texas	1880	13,840	18,590	.....	459,500	278,100	8,300	167,100	6,000
	1890	4,600	2,830	1,600	251,025	80,950	6,000	7,875	156,200

a None reported in 1890.

TABLE 1.—COMPARATIVE STATEMENT, SHIPBUILDING, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	PRODUCTS. Total value.	Vessels. Iron and steel. Number built.	Tonnage.	Value.	Vessels. Wooden. Number built.	Tonnage.	Value.	Canal boats. Number built.	Tonnage.	Value.	Other boats. Number built.	Value.	Masts, spars, repairing, and all other products. (Value.)
The United States	1880	$36,800,327	67	31,347	95,096,293	1,705	400,824	$12,389,446	643	66,707	$1,739,975	8,026	$876,999	$16,697,614
	1890	38,065,410	88	123,973	11,550,846	995	320,358	12,429,349	270	40,309	503,800	18,689	1,392,084	12,189,331
Arkansas	1880	28,000				3	300	28,000						
	1890													
California	1880	1,797,639				21	7,361	770,696				200	57,545	969,398
	1890	3,148,683	5	15,105	1,510,576	33	11,225	540,014				593	50,725	1,047,368
Connecticut	1880	767,660				52	11,473	413,009				280	37,200	317,451
	1890	1,053,301				61	21,947	763,089				255	45,985	244,227
Delaware	1880	2,162,503	22	8,925	1,262,800	33	22,198	352,169				100	18,437	529,097
	1890	2,044,313	14	7,268	1,359,133	19	10,850	338,270				248	18,778	328,132
District of Columbia	1880													
	1890	28,755				7	675	8,000				40	1,900	18,855
Florida	1880	85,050				13	217	25,000				45	16,050	44,000
	1890	68,020				26	816	21,890				71	4,870	41,260
Georgia	1880	17,000				2	539	17,000						
	1890	126,300				14	2,450	29,000						97,300
Illinois	1880	892,093				10	1,309	129,000	1	88	8,300	85	9,050	745,743
	1890	421,815				14	398	76,567				1,111	71,750	273,498
Indiana	1880	810,655				64	26,524	726,680				52	3,100	80,875
	1890	551,640				37	10,438	498,000				826	12,840	40,800
Iowa	1880	112,000				2	860	70,000						42,000
	1890	73,144				32	555	24,465				67	2,110	46,569
Kentucky	1880	249,015				23	2,130	86,215				25	1,000	161,800
	1890	95,545				8	754	10,050				1,915	46,300	39,195
Louisiana	1880	343,525				36	1,231	105,525				80	15,600	222,400
	1890	229,645				35	1,555	62,780	30	180	1,600	94	3,574	161,691
Maine	1880	2,909,846				88	41,396	2,174,650				970	53,818	681,378
	1890	2,818,565				73	48,492	2,570,373				926	65,181	183,011
Maryland	1880	1,788,630	1	55	17,500	70	3,174	218,760	60	4,270	84,000	133	45,000	1,423,370
	1890	1,737,674	2	9,189	918,900	14	7,028	200,350				216	52,526	565,898
Massachusetts	1880	2,281,666				39	5,605	391,655				3,765	186,727	1,703,284
	1890	2,248,647				114	20,720	1,003,570	3	400	16,000	5,196	298,791	930,286
Michigan	1880	2,034,636	3	1,533	387,500	66	14,376	1,002,550				210	13,117	631,469
	1890	4,710,108	5	13,000	1,190,000	89	48,532	2,905,035				1,268	65,078	549,995
Minnesota	1880	15,000												15,000
	1890	542,440	6	6,962	450,000	8	875	20,500	3	900	7,000	669	29,010	35,930
Mississippi	1880	5,500				3	33	3,500						2,000
	1890	26,425				7	327	6,000				38	3,000	17,425
Missouri	1880	565,187	7	2,740	241,000	10	711	117,487						206,700
	1890	417,236				4	232	15,700				128	7,120	394,416
New Hampshire	1880	30,070										44	4,440	25,630
	1890													
New Jersey	1880	1,384,629	4	382	75,875	39	6,063	319,239	10	1,010	14,600	134	34,460	940,455
	1890	2,592,420	6	2,600	385,000	70	25,641	741,707	6	340	15,500	318	48,547	1,401,666
New York	1880	7,985,044	6	679	89,000	188	25,852	1,686,011	441	49,887	1,370,525	1,221	263,957	4,575,551
	1890	6,154,488	14	7,182	487,200	149	42,999	863,730	197	34,959	403,800	2,430	352,070	4,047,688
North Carolina	1880	57,219				8	487	22,650						34,569
	1890	101,615				12	1,246	28,100	1	80	1,000	62	12,126	60,389
Ohio	1880	1,552,210				54	25,121	1,125,300	1	11	2,300	91	18,400	406,210
	1890	3,804,838	16	28,780	2,592,000	52	24,261	731,443	13	1,280	29,650	673	31,760	419,985
Oregon	1880	206,500				19	2,162	176,600						29,900
	1890	320,715				18	3,880	268,100				115	13,805	38,810
Pennsylvania	1880	6,689,470	24	17,033	3,022,618	656	176,763	1,416,190	122	10,711	237,450	318	47,888	1,965,324
	1890	3,239,770	15	32,137	2,488,037	11	22,000	168,525	14	1,570	17,050	341	33,691	532,467
Rhode Island	1880	517,041				17	379	129,000				68	27,610	360,431
	1890	239,626	4	1,500	120,000	4	205	22,500				39	9,062	88,044
South Carolina	1880	144,000				27	1,615	92,900						51,100
	1890	186,130				44	3,375	111,000	2	500	10,000	15	4,950	60,180
Texas	1880	77,780				16	758	55,780						22,000
	1890	29,777				4	25	1,250				223	20,171	8,356

TABLE 1.—COMPARATIVE STATEMENT, SHIPBUILDING, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Total cost of all materials.	QUANTITIES OF PRINCIPAL MATERIALS USED.		
				Employés.	Wages.		Iron and steel. (Pounds.)	Yellow metal and brass. (Pounds.)	Duck. (Yards.)
Vermont	1880	3	$20,700	12	$4,400	$9,200	52,000	.....	.....
	1890	3	8,950	14	4,572	2,859	8,000	.....	.....
Virginia	1880	65	185,960	146	75,526	74,578	183,125	8,500	9,270
	1890	17	310,726	209	99,694	83,694	283,000	9,500	.....
Washington	1880	11	33,000	62	51,298	121,300	519,700	7,000	6,606
	1890	17	155,620	186	97,216	68,885	341,000	150	4,900
West Virginia	1880	19	55,000	99	51,510	162,300	389,300	3,200	3,900
	1890	4	21,303	57	17,550	8,252	25,000	.....	.....
Wisconsin	1880	24	208,700	474	223,573	268,303	2,231,400	6,500	134,500
	1890	16	544,828	311	205,005	178,351	1,170,650	65	432
All other states	a1880	4	26,800	51	26,400	59,100	158,000	21,700	800
	b1890	7	40,000	98	32,016	15,788	62,111	3,000	1,526

a Includes establishments distributed as follows: Alabama, 1; Kansas, 1; Nebraska, 1; Tennessee, 1.
b Includes establishments distributed as follows: Alabama, 5; Arkansas, 1; Tennessee, 1.

TABLE 1.—COMPARATIVE STATEMENT, SHIPBUILDING, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	QUANTITIES OF PRINCIPAL MATERIALS USED—continued.							
		Manilla rope. (Pounds.)	Hemp cordage. (Pounds.)	Knees. (Number.)	Lumber.				
					Total. (Feet.)	Hard pine. (Feet.)	White pine. (Feet.)	White oak. (Feet.)	All other kinds. (Feet.)
Vermont	1880	1,420	.....	102	184,200	.....	120,400	63,800	.....
	1890	.....	.....	.....	118,000	10,000	10,000	5,000	93,000
Virginia	1880	7,240	4,350	931	720,900	493,000	30,300	190,600	7,000
	1890	3,795	28,000	56	1,889,800	1,107,200	1,000	317,700	463,900
Washington	1880	6,700	3,800	147	890,000	.....	.....	16,000	874,000
	1890	700	5,000	214	1,712,600	54,000	22,500	32,500	1,603,600
West Virginia	1880	6,400	.....	.....	3,363,000	.....	2,093,000	1,228,000	42,000
	1890	.....	.....	100	200,000	20,000	20,000	145,000	15,000
Wisconsin	1880	16,020	1,000	1,635	4,848,200	.....	1,081,100	3,755,600	11,500
	1890	330	.....	973	4,047,152	5,000	750,058	3,035,594	256,500
All other states	1880	980	.....	.....	187,000	38,000	48,000	101,000	.....
	1890	500	.....	12	446,822	339,872	.....	95,200	11,750

TABLE 1.—COMPARATIVE STATEMENT, SHIPBUILDING, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

STATES AND TERRITORIES.	Year.	PRODUCTS. Total value.	Vessels. Iron and steel. Number built.	Iron and steel. Tonnage.	Iron and steel. Value.	Vessels. Wooden. Number built.	Wooden. Tonnage.	Wooden. Value.	Canal boats. Number built.	Canal boats. Tonnage.	Canal boats. Value.	Other boats. Number built.	Other boats. Value.	Masts, spars, repairing, and all other products. (Value.)
Vermont	1880	$17,800							5	550	$17,800			
	1890	8,289							1	100	2,200	41	$2,574	$3,515
Virginia	1880	181,024				23	334	$57,050	3	180	5,000	48	9,800	109,174
	1890	297,000				14	2,869	70,000				24	1,980	225,020
Washington	1880	184,500				14	1,769	161,600				80	1,900	21,000
	1890	188,685	1	250	$50,000	8	1,739	48,850				234	63,010	26,825
West Virginia	1880	231,130				85	16,727	221,230						9,900
	1890	38,980				2	225	16,500				97	2,420	20,060
Wisconsin	1880	576,305				21	3,079	254,000				77	11,900	310,405
	1890	463,120				11	3,808	253,991				416	16,360	192,769
All other states	1880	100,000				3	278	40,000						60,000
	1890	57,701				1	216	10,000						47,701

TABLE 2.—DETAILED STATEMENT, SHIPBUILDING,

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.				
			Value of hired property.	Direct investment.			
				Aggregate.	Value of plant.		
					Total.	Land.	Buildings.	Machinery, tools, and implements.
1	The United States	1,010	$2,950,055	$53,393,074	$39,870,865	$14,294,878	$10,170,201	$15,405,486
2	Alabama	5	4,910	37,750	33,500	500	5,700	27,300
3	California	33	92,100	6,863,308	5,896,480	424,222	1,766,053	3,706,205
4	Connecticut	29	52,600	564,941	248,012	85,700	61,400	100,912
5	Delaware	11	37,100	1,745,213	917,850	309,700	282,900	325,250
6	District of Columbia	4	600	15,575	8,375	5,500	1,600	1,275
7	Florida	16	8,500	93,156	86,675	26,400	45,820	14,455
8	Georgia	4	8,500	156,100	133,100	5,500	8,100	119,500
9	Illinois	10	6,800	638,439	500,234	399,113	65,450	35,671
10	Indiana	11	3,850	371,860	103,545	53,850	26,400	23,295
11	Iowa	5	.....	38,850	34,700	3,175	8,375	23,150
12	Kentucky	29	12,500	53,511	46,535	15,850	10,650	20,035
13	Louisiana	13	13,000	368,218	280,088	59,925	22,525	197,638
14	Maine	85	100,825	1,027,756	243,965	76,990	62,175	104,800
15	Maryland	34	464,270	1,315,262	509,975	134,050	29,480	346,445
16	Massachusetts	147	360,285	1,239,998	399,755	165,135	91,355	143,265
17	Michigan	62	225,400	3,266,472	944,189	287,500	446,418	210,271
18	Minnesota	20	20,600	521,373	47,995	7,900	7,400	32,695
19	Mississippi	9	600	8,554	6,796	2,200	1,410	3,186
20	Missouri	5	3,450	125,625	113,425	42,000	12,075	59,350
21	New Jersey	62	514,200	2,165,104	1,325,929	484,775	214,695	626,459
22	New York	217	806,815	16,481,649	14,545,339	7,594,833	3,210,840	3,739,666
23	North Carolina	16	18,100	76,978	56,775	16,295	17,730	22,750
24	Ohio	44	33,600	2,950,811	1,613,610	626,245	351,865	635,500
25	Oregon	14	1,400	305,220	252,220	129,950	33,970	88,300
26	Pennsylvania	32	55,750	2,443,063	1,488,165	677,025	292,625	518,515
27	Rhode Island	15	25,000	316,665	164,780	47,500	24,200	93,080
28	South Carolina	8	17,500	128,020	48,200	20,500	15,400	12,300
29	Texas	9	800	9,619	6,210	985	2,400	2,825
30	Vermont	3	150	8,950	4,550	900	2,300	1,350
31	Virginia	18	31,000	6,388,976	6,302,701	1,048,580	1,831,830	3,422,291
32	Washington	17	17,500	155,620	123,340	3,680	71,310	48,350
33	West Virginia	4	500	21,303	15,475	2,800	8,050	4,625
34	Wisconsin	16	6,850	544,828	424,070	168,600	140,300	115,170
35	All other states (a)	3	5,000	2,944,307	2,944,107	1,367,000	997,500	579,607

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 1; New Hampshire, 1; Tennessee, 1.

BY STATES AND TERRITORIES: 1890.

CAPITAL—continued.					MISCELLANEOUS EXPENSES.							
Direct investment—Continued.												
Live assets.												
Total.	Raw materials.	Stock in process.	Finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Amount paid to contractors.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	
$13,522,409	$2,469,018	$3,116,265	$1,876,033	$6,061,093	$1,392,551	$215,343	$116,785	$95,735	$271,206	$214,205	$90,289	$388,988	1
4,250	1,600	450	.....	2,200	1,085	395	130	.....	300	.....	.....	260	2
966,828	295,161	198,446	52,570	420,651	378,104	6,581	9,058	4,262	36,448	117,528	15,215	189,012	3
316,929	190,025	54,850	28,075	43,979	20,403	3,180	2,265	2,568	2,975	.....	2,972	6,503	4
827,363	243,015	143,000	75,700	365,648	69,819	2,344	6,885	1,625	27,397	.....	1,400	30,168	5
7,200	350	2,500	1,550	2,800	654	50	24	55	300	.....	.....	225	6
6,481	2,020	2,250	430	1,781	2,083	725	478	425	455	.....	.....	.....	7
23,000	5,000	6,000	2,000	10,000	9,384	500	1,000	834	1,050	.....	3,500	2,500	8
138,205	53,797	13,866	13,505	57,037	11,723	530	3,682	1,227	767	.....	2,860	2,657	9
268,315	55,525	145,200	1,200	66,390	7,722	336	2,522	2,224	1,835	500	.....	305	10
4,150	3,100	.....	800	250	3,997	.....	317	165	2,200	.....	1,300	15	11
6,976	2,550	1,427	96	2,903	3,157	986	571	20	805	.....	.....	775	12
88,130	14,367	22,900	9,090	41,773	13,227	891	1,417	1,200	9,709	.....	.....	10	13
783,791	140,520	331,492	140,825	170,954	109,032	8,369	5,786	7,721	3,601	69,627	4,824	9,104	14
805,287	51,590	122,165	451,775	179,757	92,677	28,417	11,186	15,554	10,180	.....	14,790	12,550	15
840,243	186,288	235,260	86,852	331,843	71,604	29,414	5,327	5,068	6,409	16,000	1,721	7,665	16
2,322,283	315,139	368,921	207,209	1,431,014	97,736	14,180	12,042	7,779	19,038	.....	19,409	25,288	17
473,378	5,415	7,500	455,688	4,775	2,570	1,484	259	166	350	.....	186	125	18
1,758	208	500	300	750	157	45	75	.....	32	.....	.....	5	19
12,209	7,500	3,200	100	1,409	18,067	165	1,125	547	10,030	.....	.....	6,200	20
839,175	151,554	433,000	69,560	185,061	89,200	43,257	5,209	10,030	21,232	.....	1,211	8,261	21
1,936,310	393,486	278,150	91,733	1,172,941	166,442	58,922	17,152	14,308	31,235	150	15,846	28,829	22
20,203	4,450	7,150	1,125	7,478	3,423	1,020	751	297	435	.....	150	770	23
1,337,201	63,963	515,340	82,035	675,863	86,986	2,655	9,829	8,055	46,345	.....	1,225	18,877	24
53,000	5,100	17,200	11,700	19,000	9,508	930	1,735	70	5,045	.....	1,000	728	25
954,898	139,220	117,554	15,975	682,149	82,941	4,062	9,748	6,215	20,873	10,400	920	30,723	26
151,885	43,760	32,725	34,000	41,400	5,271	2,050	902	1,240	450	.....	.....	629	27
79,820	7,270	27,475	20,000	25,075	11,554	1,112	775	1,212	7,050	.....	.....	1,405	28
3,409	1,160	1,150	535	564	425	58	17	.....	350	.....	.....	.....	29
4,400	1,200	1,200	.....	2,000	153	10	3	50	65	.....	.....	25	30
86,275	12,295	9,330	5,200	59,450	4,436	712	1,193	261	1,775	.....	25	470	31
32,280	3,600	8,625	15,155	4,900	5,037	900	729	1,211	830	.....	.....	1,367	32
5,828	1,320	2,260	.....	2,248	2,307	50	797	20	250	.....	1,150	40	33
120,758	67,270	5,179	1,250	47,059	11,157	563	3,796	1,326	1,390	.....	585	3,497	34
200	200	.....	.....	.....	450	450	.....	.....	.....	.....	.....	.....	35

TABLE 2.—DETAILED STATEMENT, SHIPBUILDING,

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					
		Aggregates.		Officers, firm members, and clerks.			
		Average number.	Total wages.	Males above 16 years.		Females above 15 years.	
				Number.	Wages.	Number.	Wages.
1	The United States	25,934	$16,028,847	1,112	$1,188,407	11	$6,463
2	Alabama	85	25,074	3	750		
3	California	1,792	1,468,989	15	60,146		
4	Connecticut	652	376,122	28	27,904		
5	Delaware	1,802	899,151	41	96,926	2	1,248
6	District of Columbia	14	8,410				
7	Florida	76	33,621	7	3,740		
8	Georgia	118	61,134	6	6,080		
9	Illinois	331	187,021	15	14,722	1	433
10	Indiana	551	253,733	8	6,794		
11	Iowa	48	26,926	3	1,825		
12	Kentucky	88	41,577	26	15,612		
13	Louisiana	192	119,555	17	15,104		
14	Maine	1,539	843,715	86	64,545	3	1,176
15	Maryland	1,075	649,342	32	28,859		
16	Massachusetts	1,188	865,928	112	96,961		
17	Michigan	2,284	1,267,102	92	81,657	1	244
18	Minnesota	319	178,608	11	9,924		
19	Mississippi	47	15,742	2	764		
20	Missouri	357	159,224	11	11,381		
21	New Jersey	1,186	890,789	70	73,499		
22	New York	5,529	3,810,394	232	275,083	3	3,162
23	North Carolina	138	50,484	12	8,496		
24	Ohio	2,822	1,521,212	143	128,967		
25	Oregon	208	135,222	9	7,597		
26	Pennsylvania	2,022	1,215,876	47	76,096		
27	Rhode Island	200	133,453	16	15,980		
28	South Carolina	83	47,286	7	6,360		
29	Texas	31	11,788	2	918		
30	Vermont	14	4,572	2	312		
31	Virginia	510	345,454	15	9,988		
32	Washington	186	97,216	15	12,711		
33	West Virginia	57	17,550	2	700		
34	Wisconsin	311	205,005	25	28,006	1	200
35	All other states	79	61,572				

BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.

Operatives, skilled and unskilled.						Piecework ers.				
Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		
Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
23,499	$14,212,969	7	$2,272	174	$26,344	1,129	$592,142	2	$250	1
74	21,715					8	2,609			2
1,726	1,390,623					51	18,220			3
611	340,198			3	500	10	7,520			4
1,610	777,472	6	2,000	141	20,805	2	700			5
14	8,410									6
62	28,155					7	1,726			7
112	55,054									8
299	169,370			16	2,496					9
543	246,939									10
45	25,101									11
62	25,965									12
165	96,139					10	8,312			13
1,421	771,925			1	25	28	6,044			14
1,030	618,945			2	338	11	1,200			15
1,009	746,557					67	22,410			16
1,954	1,069,898	1	272	10	2,080	226	112,951			17
308	168,684									18
43	14,178					2	800			19
196	87,843					150	60,000			20
1,100	801,066					16	16,224			21
5,202	3,459,100			1	100	89	72,699	2	250	22
89	37,468					37	4,520			23
2,462	1,288,095					217	104,150			24
199	127,625									25
1,787	991,093					188	148,687			26
184	117,473									27
71	40,556					5	370			28
24	7,870					5	3,000			29
12	4,260									30
495	335,466									31
171	84,505									32
55	16,850									33
285	176,799									34
79	61,572									35

TABLE 2.—DETAILED STATEMENT, SHIPBUILDING,

	STATES AND TERRITORIES.	MATERIALS USED.										
		Aggregate cost.	Lumber.									
			Total.		White oak.		Other oak.		Hard pine.		White pine	
			Feet (board measure).	Cost.	Feet (board measure).	Cost.	Feet (board measure).	Cost.	Feet (board measure).	Cost.	Feet (board measure).	Cost.
1	The United States	$16,925,109	193,530,629	$5,836,275	57,733,487	$1,771,966	12,995,872	$452,826	62,190,453	$1,643,339	25,031,343	$868,069
2	Alabama	9,493	316,822	4,498	11,200	590	250	20	299,872	3,758		
3	California	1,295,562	8,193,185	261,538	72,291	9,265	382,850	36,853	4,419,846	101,647	390,470	15,992
4	Connecticut	535,093	10,700,688	282,456	1,611,600	50,383	343,588	10,402	6,381,900	165,243	545,200	21,854
5	Delaware	836,979	4,457,911	153,052	968,660	33,889	208,000	4,795	1,984,597	46,997	945,049	38,481
6	District of Columbia	9,940	184,330	5,776	14,000	580			137,730	3,816	22,000	860
7	Florida	21,702	583,700	11,099	11,000	570	4,300	320	426,000	6,206	10,300	660
8	Georgia	45,716	743,600	17,092	44,000	2,640	12,000	620	552,000	9,332	30,000	3,000
9	Illinois	148,127	2,347,158	76,864	1,476,048	46,014	123,000	4,335			388,710	12,810
10	Indiana	204,229	5,675,700	134,688	1,371,400	25,064	1,937,000	39,425	1,116,000	32,845	603,300	18,370
11	Iowa	22,820	511,955	14,980	120,176	3,716	70,000	2,100	8,000	340	302,611	8,524
12	Kentucky	31,675	718,750	17,838	337,500	7,849	3,000	60			182,500	5,375
13	Louisiana	71,259	1,247,042	33,139	157,874	8,468	56,229	2,721	785,820	15,392		
14	Maine	1,423,175	27,130,029	764,412	3,495,990	132,248	1,126,248	35,402	15,820,822	417,933	2,236,891	69,128
15	Maryland	737,457	6,050,220	163,363	1,503,600	40,852	867,500	17,567	2,318,000	57,591	665,700	28,115
16	Massachusetts	890,405	16,507,747	520,391	2,238,092	96,595	1,276,453	53,997	4,389,690	124,813	2,448,289	92,709
17	Michigan	2,300,299	26,243,023	685,962	21,206,058	550,003	229,800	7,435	1,026,000	19,847	2,806,082	79,996
18	Minnesota	322,412	1,147,800	23,947	294,600	6,403	43,000	1,292	455,100	6,505	243,000	4,828
19	Mississippi	7,495	297,700	4,245	1,000	35	1,500	60	221,900	2,694		
20	Missouri	145,707	2,847,800	95,230	2,000,000	70,000	73,500	3,123	150,000	4,500	602,200	17,195
21	New Jersey	1,140,452	14,321,420	518,987	2,686,000	105,717	1,928,525	81,903	6,676,595	208,083	1,710,411	68,671
22	New York	2,499,835	33,277,646	1,149,413	7,033,004	266,041	1,977,554	78,186	10,341,862	315,269	5,721,976	214,401
23	North Carolina	30,396	957,475	16,163	92,000	2,086	22,625	563	568,000	8,431	9,000	360
24	Ohio	1,750,939	10,421,433	274,072	5,694,546	146,382	914,300	23,854	558,000	11,303	2,120,687	58,546
25	Oregon	119,036	2,798,050	72,573	292,150	11,786	118,200	2,842			312,500	12,500
26	Pennsylvania	1,759,582	5,020,773	221,370	1,202,854	40,684	538,000	16,997	805,869	21,976	1,689,559	64,185
27	Rhode Island	68,900	419,595	14,181	98,175	3,731	41,700	1,522	105,700	2,944	78,350	3,006
28	South Carolina	46,752	1,173,000	30,162	65,000	3,750	91,500	6,800	994,500	17,412	22,000	2,200
29	Texas	12,808	251,025	7,221	7,875	225	4,250	150	80,950	1,974	6,000	430
30	Vermont	2,859	118,000	2,104	5,000	200	5,000	150	10,000	250	10,000	500
31	Virginia	148,879	2,117,300	57,150	324,700	9,543	268,400	8,943	1,136,700	24,423	91,000	3,630
32	Washington	68,885	1,712,600	31,136	32,500	3,300	9,600	944	54,000	1,350	22,500	550
33	West Virginia	8,252	200,000	4,380	145,000	2,900	4,000	80	20,000	600	20,000	600
34	Wisconsin	178,351	4,047,152	115,308	3,035,594	89,447	31,000	1,055	5,000	125	750,058	18,568
35	All other states	29,638	790,000	21,485	84,000	1,010	303,000	8,310	340,000	9,540	45,000	2,025

BY STATES AND TERRITORIES: 1890—Continued.

MATERIALS USED—continued.													
Lumber—Continued.												Knees.		
Fir.		Spruce.		Hackmatack.		Cedar.		Cypress.		All other lumber.		Number.	Cost.	
Feet (board measure).	Cost.	Feet (board measure).	Cost.	Feet (board measure).	Cost.	Feet (board measure).	Cost.	Feet (board measure).	Cost.	Feet (board measure).	Cost.			
4,041,533	$85,923	11,145,286	$221,861	1,939,420	$65,016	1,944,890	$76,989	459,705	$14,532	16,048,640	$635,754	79,725	$159,019	1
								2,000	60	3,506	70	12	42	2
1,207,000	34,320	365,965	10,911			638,450	24,738			736,313	27,812	2,784	6,569	3
60,000	2,400	272,200	4,915	190,000	5,275	24,700	1,330	1,000	50	1,270,500	20,604	6,445	12,155	4
		64,797	777			12,000	550	50,000	2,500	224,808	25,063	1,570	3,190	5
										10,600	520	30	75	6
		26,300	596			2,300	79	95,000	2,351	8,500	317	460	550	7
				50,000	600					55,600	900	1,701	5,829	8
		16,700	335			157,700	6,400			185,000	6,970	575	948	9
										648,000	18,984	315	670	10
		168	5							11,000	295			11
								8,000	210	187,750	4,344			12
		62,020	1,300			200	21	116,000	4,070	68,899	1,167	734	1,502	13
10,000	500	1,602,315	28,880	1,055,420	39,344	102,975	5,166			1,679,368	35,811	20,405	47,335	14
		591,700	13,236	1,000	50	33,600	1,355	5,620	125	63,500	4,472	2,420	4,605	15
10,000	800	2,899,311	49,159	368,100	11,202	208,135	6,655	32,085	1,139	2,637,592	83,322	9,432	19,614	16
1,000	20	38,409	1,049	5,000	142	51,000	1,386			879,683	26,054	7,888	10,666	17
		100	2			99,500	4,335			12,500	582	185	325	18
								50,300	918	23,000	538	240	620	19
						20,000	350			2,100	62			20
21,800	815	403,726	9,674	143,000	4,320	90,830	3,662			660,533	66,122	4,788	10,578	21
21,000	650	4,145,654	85,874	72,800	2,379	213,850	12,455	6,600	277	3,743,346	173,881	9,888	20,195	22
		6,000	120			27,650	705	18,100	555	214,100	3,343	410	650	23
										1,133,900	33,787	1,380	2,007	24
1,097,000	20,643	377,200	7,397	54,000	1,700	62,000	750			485,000	14,955	2,620	3,671	25
83,233	2,913	227,580	6,595			55,200	1,392			418,478	66,628	1,140	2,015	26
		26,150	467	100	4	12,800	525			56,620	1,982	590	857	27
												770	2,040	28
						9,000	450	65,000	2,002	77,950	1,990	1,600	675	29
										88,000	1,004			30
		9,000	329			6,000	220	7,000	200	274,500	9,862	56	65	31
1,530,500	22,842	1,000	50			48,000	1,735			14,500	365	214	403	32
										11,000	200	100	250	33
		9,000	190			54,000	2,205			162,500	3,718	973	1,518	34
						15,000	525	3,000	75					35

TABLE 2.—DETAILED STATEMENT, SHIPBUILDING,

	STATES AND TERRITORIES.	MATERIALS USED—continued.									
		Cost of metal.									Boilers and machinery. (Cost.)
		Total.	Iron bolts, spikes, rivets, straps, stanchions, girders, etc.	Steel chords, arches, straps, girders, and knees.	Rolled iron plates, beams, angles, etc.	Forgings, iron and steel.	Iron castings.	Anchors and chains.	Yellow metal, including bolts and spikes.	All other iron work, cast or wrought.	
1	The United States	$4,872,074	$1,219,237	$410,050	$1,858,428	$474,638	$226,979	$213,927	$443,274	$25,541	$2,913,856
2	Alabama	1,250	1,090						160		
3	California	784,607	79,583	293,580	46,750	151,100	40,590	8,460	164,459	85	4,000
4	Connecticut	72,858	49,004			150	1,210	12,094	8,500	1,900	51,025
5	Delaware	272,295	28,217		131,348	45,991	27,106	37,100	2,271	262	223,102
6	District of Columbia	1,130	705						425		
7	Florida	3,533	2,684						734	115	1,435
8	Georgia	4,320	3,425	135				150	610		8,000
9	Illinois	14,771	13,046	25				500	1,200		32,000
10	Indiana	29,213	29,013					200			300
11	Iowa	1,057	457						600		
12	Kentucky	4,401	3,401						1,000		
13	Louisiana	16,019	4,735	1,200				350	9,734		10,500
14	Maine	215,551	138,581	1,617				51,909	22,860	584	34,016
15	Maryland	119,895	27,788		59,752	14,880	5,700		6,740	5,035	407,000
16	Massachusetts	103,851	62,990	800				14,255	21,385	4,721	65,112
17	Michigan	507,489	150,899	49,341	254,980	9,900	11,130	27,156	2,632	1,451	753,214
18	Minnesota	212,980	16,190		183,100	4,000	3,000	6,490	40	200	29,580
19	Mississippi	787	787								
20	Missouri	33,675	33,175							500	7,000
21	New Jersey	182,281	64,675	3,500	49,000	10,000	4,250	8,758	41,614	484	210,400
22	New York	670,682	317,758	6,480	184,530	47,470	15,591	13,176	82,507	3,170	149,276
23	North Carolina	8,553	4,564	100				100	1,679	2,110	900
24	Ohio	713,676	81,956	44,756	530,126	28,446	6,428	13,155	7,085	1,724	393,293
25	Oregon	9,638	6,544					2,660	434		10,100
26	Pennsylvania	781,658	52,421		401,042	149,201	105,550	13,573	59,787	84	445,260
27	Rhode Island	7,632	2,816	3,280				108	1,233	195	34,810
28	South Carolina	10,720	6,120					700	3,850	50	
29	Texas	1,609	1,344					40	5	220	
30	Vermont	200	200								
31	Virginia	39,439	6,428		17,400	6,500	4,900	1,990	1,100	1,121	24,815
32	Washington	14,526	5,891	25		7,000	1,480	310	20		10,075
33	West Virginia	705	305		400						
34	Wisconsin	26,818	20,765	5,211			44	758	10	30	5,758
35	All other states	4,305	2,180					25	600	1,500	2,975

BY STATES AND TERRITORIES: 1890—Continued.

MATERIALS USED—continued.

Cost of cordage.			Blocks.		Duck.		Painting. (Cost.)	Oakum and pitch. (Cost.)	Masts and spars (not made in yard). (Cost.)	Fittings and furniture (not made in yard). (Cost.)	Fuel. (Cost.)	Rent of power and heat. (Cost.)	All other materials. (Cost.)	
Wire.	Hemp.	Manilla.	Number.	Cost.	Yards.	Cost.								
$89,114	$54,337	$165,819	28,275	$74,927	641,791	$141,319	$332,690	$227,994	$204,365	$461,245	$232,570	$4,955	$1,153,950	1
.....	.....	.....	.....	.....	1,526	153	303	1,058	.....	.....	250	.....	1,939	2
4,650	200	10,170	349	2,384	47,782	9,475	6,402	14,277	7,630	2,651	69,986	720	110,303	3
9,612	2,225	9,150	1,024	2,407	69,235	12,857	10,865	6,476	16,830	4,500	70	200	41,407	4
4,388	4,538	9,213	1,720	4,476	25,035	5,007	17,775	4,173	10,746	41,926	16,326	.....	66,772	5
.....	.....	.....	.....	.....	500	60	675	260	.....	100	.....	.....	1,864	6
258	249	872	18	180	2,325	291	1,147	1,024	820	.....	5	.....	249	7
60	100	50	111	980	.....	.....	700	1,580	555	.....	350	.....	6,100	8
25	.....	25	.....	.....	100	300	2,177	6,237	.....	3,250	6,030	.....	5,500	9
100	80	3,000	240	700	23,000	2,820	6,184	6,259	400	170	710	.....	18,935	10
.....	.....	.....	.....	.....	307	38	841	807	.....	30	10	.....	5,057	11
.....	350	55	.....	.....	2,900	290	1,530	3,883	.....	.....	.....	.....	3,228	12
5	183	196	50	87	200	60	2,469	2,462	660	200	48	.....	3,729	13
29,905	17,024	42,275	9,053	22,474	181,949	46,696	23,538	17,600	45,040	39,845	1,640	240	75,584	14
100	150	400	.....	.....	4,100	820	5,905	5,664	.....	.....	10,450	.....	19,105	15
4,513	2,100	7,909	3,490	5,535	45,941	10,840	34,654	23,516	26,283	13,119	3,791	100	49,077	16
14,588	500	28,632	4,053	8,115	61,326	16,644	48,283	22,217	11,400	89,603	15,036	200	87,750	17
75	105	5,000	16	85	7,419	2,325	977	653	.....	5,500	594	.....	40,396	18
.....	.....	18	.....	.....	.....	.....	55	720	.....	1,050	.....	.....	.....	19
20	.....	.....	.....	.....	250	50	350	5,000	.....	.....	.....	.....	4,382	20
9,325	18,909	18,985	3,926	13,585	32,102	5,096	26,781	26,021	42,352	2,100	1,898	.....	23,154	21
3,381	576	4,778	1,347	2,851	43,108	8,250	48,867	45,854	27,613	26,036	25,188	3,465	313,410	22
25	206	84	100	250	3,400	369	1,472	512	50	62	500	.....	600	23
3,366	512	8,469	450	1,505	18,584	3,904	32,742	8,879	3,924	99,352	28,909	.....	176,329	24
100	1,700	1,000	225	575	10,700	2,720	2,442	3,100	3,022	750	20	.....	7,625	25
2,500	231	11,422	1,387	7,045	50,480	10,111	44,851	5,737	5,350	125,211	40,974	.....	55,847	26
129	.....	787	55	55	3,790	1,078	1,718	618	.....	690	2,499	.....	3,846	27
.....	.....	1,200	100	400	.....	.....	200	1,000	.....	.....	800	.....	230	28
569	399	822	115	110	400	82	595	177	.....	.....	.....	.....	549	29
.....	.....	.....	.....	.....	.....	.....	25	.....	.....	.....	.....	30	500	30
230	3,000	1,015	350	950	.....	.....	4,463	2,591	700	4,375	3,100	.....	6,986	31
1,150	1,000	165	36	143	4,900	930	1,765	1,702	400	550	3,295	.....	1,645	32
.....	.....	.....	.....	.....	.....	.....	540	1,745	.....	.....	2	.....	630	33
40	.....	47	50	10	432	53	856	6,117	590	25	89	.....	21,122	34
.....	.....	80	10	25	.....	.....	543	75	.....	150	.....	.....	.....	35

TABLE 2.—DETAILED STATEMENT, SHIPBUILDING,

	STATES AND TERRITORIES.	PRODUCTS.											
			Iron and steel vessels built.										
		Aggregate value.	Total.			Sail.			Steam.			Barges.		
			Number.	Tonnage.	Value.	Number.	Tonnage.	Value.	Number.	Tonnage.	Value.	Number.	Tonnage.	Value.
1	The United States	$40,342,115	101	148,929	$13,256,703	8	4,224	$211,200	88	138,751	$12,720,503	5	5,954	$325,000
2	Alabama	38,701												
3	California	3,547,331	9	17,928	1,792,862				9	17,928	1,792,862			
4	Connecticut	1,053,301												
5	Delaware	2,044,313	14	7,268	1,359,133				14	7,268	1,359,133			
6	District of Columbia	28,755												
7	Florida	68,020												
8	Georgia	126,300												
9	Illinois	421,815												
10	Indiana	551,640												
11	Iowa	73,144												
12	Kentucky	95,545												
13	Louisiana	229,645												
14	Maine	2,818,565												
15	Maryland	1,737,674	2	9,189	918,900				2	9,189	918,900			
16	Massachusetts	2,248,647												
17	Michigan	4,710,108	5	13,000	1,190,000				5	13,000	1,190,000			
18	Minnesota	542,440	6	6,962	450,000				1	1,008	125,000	5	5,954	325,000
19	Mississippi	26,425												
20	Missouri	417,236												
21	New Jersey	2,592,420	6	2,600	385,000				6	2,600	385,000			
22	New York	7,581,570	19	26,927	1,671,909	5	1,424	71,200	14	25,503	1,600,709			
23	North Carolina	101,615												
24	Ohio	3,804,838	16	28,780	2,592,000	2	2,200	110,000	14	26,580	2,482,000			
25	Oregon	320,715												
26	Pennsylvania	3,239,770	15	32,137	2,488,037				15	32,137	2,488,037			
27	Rhode Island	239,626	4	1,500	120,000	1	600	30,000	3	900	90,000			
28	South Carolina	186,130												
29	Texas	29,777												
30	Vermont	8,289												
31	Virginia	665,662	4	2,388	238,862				4	2,388	238,862			
32	Washington	188,685	1	250	50,000				1	250	50,000			
33	West Virginia	38,980												
34	Wisconsin	463,120												
35	All other states	101,313												

BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.												
Wooden vessels built.												
Total.			Sail.			Steam.			Barges and canal boats.			
Number.	Tonnage.	Value.	Number.	Tonnage.	Value.	Number.	Tonnage.	Value.	Number.	Tonnage.	Value.	
1,265	360,667	$12,933,149	306	99,486	$5,129,741	294	103,390	$5,851,422	665	157,791	$1,951,986	1
												2
33	11,225	540,014	15	2,166	181,300	8	5,928	336,525	10	3,131	22,189	3
61	21,947	763,089	24	7,545	371,000	16	975	78,300	21	13,427	313,789	4
19	10,850	338,270	9	5,857	262,300	4	613	36,800	6	4,380	39,170	5
7	675	8,000				1	15	3,500	6	660	4,500	6
26	816	21,890	13	220	11,840	1	58	3,500	12	538	6,550	7
14	2,450	29,000							14	2,450	29,000	8
14	398	76,567	4	4	367	8	274	75,000	2	120	1,200	9
37	10,438	498,000				23	6,527	421,500	14	3,911	76,500	10
32	555	24,465				25	275	22,000	7	280	2,465	11
8	754	10,050				1	88	2,950	7	666	7,100	12
65	1,735	64,380	16	145	12,500	7	520	29,500	42	1,070	22,380	13
73	48,492	2,570,373	69	47,397	2,425,373	3	1,039	139,000	1	56	6,000	14
14	7,028	200,350	3	846	47,750	2	2,132	122,000	9	4,050	30,600	15
117	21,120	1,019,570	41	11,299	662,070	10	2,221	259,500	66	7,600	98,000	16
89	48,532	2,905,035	21	10,106	454,435	52	33,701	2,349,100	16	4,725	101,500	17
11	1,775	27,500				4	275	10,500	7	1,500	17,000	18
7	327	6,000	6	267	5,100				1	60	900	19
4	232	15,700				1	97	8,500	3	135	7,200	20
76	25,981	757,207	33	10,237	469,907	10	1,712	124,800	33	14,032	162,500	21
346	77,958	1,267,530	29	1,437	82,799	47	7,876	457,831	270	68,645	726,900	22
13	1,326	29,100	1	20	1,000	3	246	17,300	9	1,060	10,800	23
65	25,541	761,093	1	80	4,000	22	9,516	609,500	42	15,945	147,593	24
18	3,880	268,100	4	1,092	76,500	12	2,288	186,600	2	500	5,000	25
25	23,570	185,575				11	22,000	168,525	14	1,570	17,050	26
4	205	22,500	2	30	2,500	2	175	20,000				27
46	3,875	121,000	6	130	17,000	3	120	50,000	37	3,625	54,000	28
4	25	1,250	2	5	1,000				2	20	250	29
1	100	2,200							1	100	2,200	30
14	2,869	70,000	4	220	9,500	4	369	33,000	6	2,280	27,500	31
8	1,739	48,850	2	338	27,000	2	151	10,000	4	1,250	11,850	32
2	225	16,500				2	225	16,500				33
11	3,808	253,991	1	45	4,500	9	3,758	249,191	1	5	300	34
1	216	10,000				1	216	10,000				35

TABLE 2.—DETAILED STATEMENT, SHIPBUILDING,

	STATES AND TERRITORIES.	PRODUCTS—continued.										
		Boats built.										Masts and spars. (Value.)
		Total.		Ships.		Fishing.		Pleasure.		Life.		
		Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	
1	The United States	18,739	$1,442,084	957	$144,227	4,541	$198,608	12,481	$1,027,962	760	$71,287	$450,957
2	Alabama											
3	California	593	50,725	71	6,265	348	17,170	144	25,490	30	1,800	35,260
4	Connecticut	255	45,985	108	23,765	9	1,825	133	18,395	5	2,000	325
5	Delaware	248	18,778	110	9,096	20	2,900	22	1,100	96	5,682	
6	District of Columbia	40	1,900					40	1,900			
7	Florida	71	4,870	2	90	33	1,600	36	3,180			150
8	Georgia											
9	Illinois	1,111	71,750					1,111	71,750			
10	Indiana	826	12,840					826	12,840			
11	Iowa	67	2,110			40	1,360	27	750			
12	Kentucky	1,915	46,300					1,915	46,300			
13	Louisiana	94	3,574	10	750	31	984	52	1,240	1	600	2,925
14	Maine	926	65,181	170	13,901	109	13,627	647	37,653			30,885
15	Maryland	216	52,526	17	8,400	34	31,500	165	12,626			100
16	Massachusetts	5,196	298,791	152	11,485	3,296	72,575	1,728	211,611	20	3,120	190,686
17	Michigan	1,268	65,078	46	2,350	9	4,150	1,142	55,198	71	3,380	12,062
18	Minnesota	669	29,010			13	870	652	27,865	4	275	
19	Mississippi	38	3,000	6	675	1	900	31	1,425			195
20	Missouri	128	7,120					128	7,120			
21	New Jersey	318	48,547			40	4,695	274	42,852	4	1,000	80,670
22	New York	2,430	352,070	106	10,982	155	18,860	1,747	276,850	422	45,378	53,847
23	North Carolina	62	12,126	3	510	46	7,991	13	3,625			5,162
24	Ohio	673	31,760	90	4,700	1	250	582	26,810			1,070
25	Oregon	115	13,805	6	360	64	3,520	44	9,875	1	50	3,750
26	Pennsylvania	341	33,691	9	798	2	1,135	259	25,326	71	6,432	8,833
27	Rhode Island	39	9,082			4	1,050	35	8,032			1,317
28	South Carolina	15	4,950			14	4,650	1	300			80
29	Texas	223	20,171	1	100	169	4,196	50	15,825	3	50	40
30	Vermont	41	2,574					41	2,574			
31	Virginia	24	1,980			1	400	23	1,580			3,600
32	Washington	234	63,010					234	63,010			
33	West Virginia	97	2,420					65	920	32	1,500	
34	Wisconsin	416	16,360			102	2,400	314	13,960			
35	All other states	50	50,000	50	50,000							20,000

BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.																
Repairing of vessels.										Boats, masts, and spars. (Value of repairs.)						
Total.		Sail.		Steam.		Barges.		Canal boats.		Total.	Ships' boats.	Fishing boats.	Pleasure boats.	Life-boats.	Masts and spars.	Value of all other products.	
Number.	Value of repairs.	Number.	Value of repairs.	Number.	Value of repairs.	Number.	Value of repairs.	Number.	Value of repairs.								
27,327	$10,010,629	11,408	$3,077,382	6,755	$5,409,474	3,433	$1,108,423	5,731	$415,350	$502,608	$43,226	$121,748	$260,223	$3,520	$73,891	$1,745,985	1
96	38,701	17	5,562	44	15,948	35	17,191	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
812	427,276	681	233,065	71	153,866	60	40,345	.....	.....	7,515	2,465	1,400	2,050	500	1,100	693,679	3
383	223,932	166	61,585	128	88,503	84	72,844	5	1,000	16,020	20	1,200	5,500	300	9,000	3,950	4
237	303,582	124	46,966	90	249,074	23	7,542	.....	.....	24,650	400	20,400	.....	.....	3,750	.....	5
79	15,855	63	12,800	13	3,000	1	15	2	40	3,000	.....	.....	3,000	.....	.....	.....	6
254	37,857	93	11,818	112	18,670	39	3,765	10	3,604	1,753	.....	568	1,150	.....	35	1,500	7
212	96,500	120	60,500	67	20,000	25	16,000	.....	.....	800	.....	.....	.....	.....	800	.....	8
746	272,998	277	91,694	371	144,043	42	10,221	56	27,040	500	.....	.....	500	.....	.....	.....	9
46	39,350	.....	.....	33	36,000	13	3,350	.....	.....	1,450	.....	.....	1,450	.....	.....	.....	10
91	46,519	.....	.....	48	37,641	43	8,878	.....	.....	50	.....	50	.....	.....	.....	.....	11
77	29,945	.....	.....	32	19,559	45	10,386	.....	.....	3,200	.....	.....	3,200	.....	.....	6,050	12
218	156,566	52	26,084	109	105,900	57	24,582	.....	.....	2,200	.....	400	.....	.....	1,800	.....	13
700	108,031	621	102,521	78	5,417	1	93	.....	.....	25,150	2,794	988	5,790	.....	15,578	18,945	14
1,564	523,957	1,302	336,857	203	172,580	48	13,360	11	1,160	33,241	1,800	29,991	1,450	.....	.....	8,600	15
1,811	543,914	1,359	337,476	344	172,384	90	31,054	18	3,000	110,045	9,095	21,580	74,164	390	4,816	85,641	16
747	512,007	177	122,945	291	312,014	251	71,374	28	5,674	7,085	3,750	350	2,289	81	615	18,841	17
192	31,000	50	2,000	66	16,500	13	6,200	63	6,300	3,895	.....	.....	3,715	.....	180	1,035	18
54	15,710	39	8,830	9	4,630	6	2,250	.....	.....	1,520	900	.....	500	.....	120	.....	19
90	391,525	.....	.....	56	361,025	34	30,500	.....	.....	2,891	.....	.....	2,891	.....	.....	.....	20
3,429	1,294,416	1,451	507,645	540	438,933	744	267,021	694	80,817	21,130	.....	6,400	13,850	500	380	5,450	21
10,172	3,526,556	2,714	797,438	1,901	2,199,107	972	277,597	4,585	252,414	115,949	2,540	9,050	93,029	1,449	9,881	593,709	22
177	52,994	85	24,894	42	22,000	50	6,100	.....	.....	2,233	350	625	1,227	.....	31	.....	23
1,140	311,575	223	42,050	774	239,600	86	23,350	57	6,075	12,390	200	.....	12,190	.....	.....	94,950	24
18	32,500	2	2,500	13	26,000	3	4,000	.....	.....	2,560	10	2,550	.....	.....	.....	.....	25
1,218	287,324	155	17,852	581	176,903	329	75,343	153	17,226	42,482	89	2,000	15,053	300	25,040	193,828	26
469	72,312	355	45,400	89	24,200	25	2,712	.....	.....	14,415	.....	1,800	12,565	.....	50	.....	27
288	49,600	140	14,000	80	24,000	68	11,600	.....	.....	9,300	300	7,550	1,200	.....	250	1,200	28
85	4,250	85	4,250	.....	.....	.....	.....	.....	.....	4,066	.....	3,751	250	.....	65	.....	29
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,515	30
784	333,350	402	84,850	191	196,000	177	49,500	14	3,000	17,870	6,200	11,045	225	.....	400	.....	31
35	12,300	10	250	19	10,900	6	1,150	.....	.....	2,525	.....	.....	2,525	.....	.....	12,000	32
75	20,000	.....	.....	.....	.....	40	12,000	35	8,000	60	.....	.....	60	.....	.....	.....	33
998	189,227	645	75,550	350	112,077	3	1,600	.....	.....	450	.....	50	400	.....	.....	3,092	34
30	9,000	.....	.....	10	3,000	20	6,000	.....	.....	12,313	12,313	.....	.....	.....	.....	.....	35

TABLE 3.—DETAILED STATEMENT, IRON AND

	STATES.	Number of establishments reporting.	CAPITAL.						Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)	
			Value of hired property.	Direct investment.						Employés.	Wages.
				Aggregate.	Plant.			Live assets.			
					Total.	Land.	Buildings.	Machinery, tools, and implements.			
1	The United States	21	$393,000	$33,900,148	$28,491,282	$9,713,572	$7,386,783	$11,390,927	$5,408,866	$546,135	10,767	$6,579,063
2	New York	4	.....	12,940,230	12,669,765	6,901,000	2,890,865	2,877,900	270,465	25,343	2,333	1,430,906
3	Ohio	4	.....	2,107,400	1,020,800	349,300	245,200	426,300	1,086,600	64,835	1,947	1,097,684
4	All other states (b)	13	393,000	18,852,518	14,800,717	2,463,272	4,250,718	8,086,727	4,051,801	455,957	6,487	4,050,473

a Includes officers, firm members, and clerks.
b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are

TABLE 4.—DETAILED STATEMENT, WOODEN VESSEL

	STATES.	Number of establishments reporting.	CAPITAL.						Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)	
			Value of hired property.	Direct investment.						Employés.	Wages.
				Aggregate.	Plant.			Live assets.			
					Total.	Land.	Buildings.	Machinery, tools, and implements.			
1	The United States	259	$816,105	$8,928,851	$3,605,049	$1,710,655	$748,718	$1,145,676	$5,323,802	$482,377	8,173	$4,645,679
2	California	9	28,300	144,025	57,200	38,500	7,600	11,100	86,825	126,161	174	177,411
3	Connecticut	12	27,500	410,050	141,100	45,000	41,200	54,900	268,950	13,221	546	304,200
4	Delaware	4	17,600	139,915	62,300	28,500	10,350	23,450	77,615	2,799	273	160,489
5	Florida	7	3,250	8,195	4,745	2,600	470	1,675	3,450	657	31	13,026
6	Illinois	3	.....	459,287	388,335	308,000	62,600	17,735	70,952	6,861	172	101,919
7	Indiana	5	1,500	361,025	99,225	52,000	25,000	22,225	261,800	6,774	537	249,146
8	Louisiana	5	1,000	49,010	9,250	3,800	3,700	1,750	39,760	417	54	20,540
9	Maine	32	56,605	665,091	180,350	59,650	43,950	76,750	684,741	100,643	1,341	739,619
10	Maryland	7	24,000	375,075	210,775	104,000	10,200	96,575	164,300	10,028	210	142,151
11	Massachusetts	17	128,000	532,750	114,350	52,900	20,800	40,650	418,400	31,504	474	321,834
12	Michigan	20	168,550	2,385,737	383,099	193,650	89,383	100,066	2,002,638	71,362	1,326	700,411
13	Minnesota	4	2,300	29,610	19,300	3,500	2,500	13,300	10,310	990	58	29,150
14	Mississippi	3	300	1,850	1,350	550	250	550	500	110	20	5,615
15	New Jersey	16	94,400	459,545	271,539	105,075	28,790	137,674	188,006	19,688	323	205,112
16	New York	55	156,650	872,241	371,216	152,600	78,490	140,126	501,025	34,742	858	569,668
17	North Carolina	5	17,200	55,210	36,250	11,700	15,350	9,200	18,960	2,764	110	39,390
18	Ohio	16	15,800	738,905	529,990	258,290	96,100	175,600	208,915	15,939	659	329,435
19	Oregon	9	1,400	221,950	170,950	53,700	32,400	84,850	51,000	8,769	177	114,695
20	Pennsylvania	4	.....	211,850	157,150	92,400	13,300	51,450	54,700	1,800	187	107,354
21	Virginia	5	30,250	49,350	29,850	15,000	3,000	11,850	19,500	1,335	108	36,465
22	Washington	4	12,600	4,550	3,950	140	110	3,700	600	1,513	102	23,091
23	Wisconsin	3	4,000	344,405	265,500	100,000	131,500	34,000	78,905	8,185	200	142,658
24	All other states (b)	14	24,900	209,225	97,275	29,100	31,675	36,500	111,950	16,115	233	112,300

a Includes officers, firm members, and clerks.
b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are

STEEL VESSEL BUILDING, BY STATES: 1890.

Cost of materials used.	PRODUCTS. Aggregate value.	Vessels built. Total. Number.	Total. Tonnage.	Total. Value.	Sail. Number.	Sail. Tonnage.	Sail. Value.	Steam. Number.	Steam. Tonnage.	Steam. Value.	Barges. Number.	Barges. Tonnage.	Barges. Value.	Value of all other products, including repairing.	
$6,637,425	$15,206,658	101	148,929	$13,256,703	8	4,224	$211,200	88	138,751	$12,720,503	5	5,954	$325,000	$1,949,955	1
422,057	2,132,012	19	26,927	1,671,909	5	1,424	71,200	14	25,503	1,600,709				460,103	2
1,332,906	2,701,400	16	28,780	2,592,000	2	2,200	110,000	14	26,580	2,482,000				109,400	3
4,882,462	10,373,246	66	93,222	8,992,794	1	600	30,000	60	86,668	8,637,794	5	5,954	325,000	1,380,452	4

distributed as follows: California, 2; Delaware, 2; Maryland, 1; Michigan, 1; Minnesota, 1; New Jersey, 1; Pennsylvania, 2; Rhode Island, 1; Virginia, 1; Washington, 1.

BUILDING, BY STATES AND TERRITORIES: 1890.

Cost of materials used.	PRODUCTS. Aggregate value.	Vessels built. Total. Number.	Total. Tonnage.	Total. Value.	Sail. Number.	Sail. Tonnage.	Sail. Value.	Steam. Number.	Steam. Tonnage.	Steam. Value.	Barges and canal boats. Number.	Barges and canal boats. Tonnage.	Barges and canal boats. Value.	Value of all other products, including repairing.	
$6,582,032	$14,218,099	1,173	342,994	$12,439,624	291	93,816	$4,881,542	282	101,352	$5,750,100	600	147,826	$1,807,982	$1,778,475	1
216,473	556,718	28	11,112	538,864	15	2,166	181,300	8	5,928	336,525	5	3,018	21,039	17,854	2
440,006	858,390	60	21,447	745,200	24	7,545	371,000	16	975	78,300	20	12,927	295,900	113,190	3
198,726	410,890	19	10,850	338,270	9	5,857	262,300	4	613	36,800	6	4,380	39,170	72,620	4
15,750	32,709	26	816	21,890	13	220	11,840	1	58	3,500	12	538	6,550	10,819	5
95,353	249,731	14	398	76,567	4	4	367	8	274	75,000	2	120	1,200	173,164	6
199,738	537,350	37	10,438	498,000				23	6,527	421,500	14	3,911	76,500	39,350	7
30,283	66,220	65	1,735	64,380	16	145	12,500	7	520	29,500	42	1,070	22,380	1,840	8
1,348,512	2,591,411	71	48,442	2,566,073	67	47,347	2,421,073	3	1,039	139,000	1	56	6,000	25,338	9
162,364	376,807	14	7,028	200,350	3	846	47,750	2	2,132	122,000	9	4,050	30,600	176,457	10
517,131	1,133,785	103	20,290	988,570	41	11,299	662,070	9	2,091	247,500	53	6,900	79,000	145,215	11
1,546,071	2,973,039	76	46,855	2,875,035	21	10,106	454,435	51	33,624	2,344,100	4	3,125	76,500	98,004	12
20,557	56,500	11	1,775	27,500				4	275	10,500	7	1,500	17,000	29,000	13
2,100	9,835	7	327	6,000	6	267	5,100				1	60	900	3,835	14
193,198	519,499	61	18,386	490,607	25	4,794	234,107	9	1,612	120,800	27	11,980	135,700	28,892	15
713,203	1,516,996	326	74,223	1,211,300	27	1,365	79,200	43	7,643	445,700	256	65,215	686,400	305,696	16
23,841	76,795	13	1,326	29,100	1	20	1,000	3	246	17,300	9	1,060	10,800	47,695	17
340,758	879,453	63	25,361	758,943	1	80	4,000	22	9,516	609,500	40	15,765	145,443	120,510	18
111,530	295,195	18	3,880	268,100	4	1,092	76,500	12	2,288	186,600	2	500	5,000	27,095	19
126,623	238,735	23	23,120	182,525				11	22,000	168,525	12	1,120	14,000	56,210	20
39,294	110,450	11	2,616	52,500	3	120	6,000	2	216	19,000	6	2,280	27,500	57,950	21
17,247	48,600	7	1,539	47,500	2	338	27,000	2	151	10,000	3	1,050	10,500	1,100	22
108,867	313,645	8	2,463	199,800	1	45	4,500	6	2,413	195,000	1	5	300	113,845	23
114,347	365,346	112	8,567	252,550	8	160	19,500	36	1,211	133,450	68	7,196	99,600	112,796	24

distributed as follows: Arkansas, 1; District of Columbia, 2; Georgia, 2; Iowa, 1; Kentucky, 1; Missouri, 1; Rhode Island, 2; South Carolina, 2; Vermont, 1; West Virginia, 1.

TABLE 5.—DETAILED STATEMENT, BOAT BUILDING AND MANUFACTURE

	STATES.	Number of establishments reporting.	CAPITAL.						Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)	
			Value of hired property.	Direct investment.						Employés.	Wages.
				Aggregate.	Plant.			Live assets.			
					Total.	Land.	Buildings.	Machinery, tools, and implements.			
1	The United States	503	$618.208	$5,131,857	$4,010,107	$1,790,251	$1,290,040	$929,816	$1,121,750	$110,129	2,196	$1,391,155
2	California	9	41,200	47,050	26,000	2,000	15,600	8,400	21,050	4,938	57	53,256
3	Connecticut	12	19,000	77,591	47,362	11,700	8,200	27,462	30,229	4,393	51	34,002
4	Delaware	5	1,500	21,798	15,550	6,200	7,550	1,800	6,248	1,339	24	12,941
5	Florida	6	3,750	9,361	8,230	5,800	1,250	180	1,131	301	11	3,990
6	Illinois	4	5,200	98,868	49,948	37,113	.....	12,835	48,920	3,030	80	32,636
7	Indiana	6	2,350	10,835	4,320	1,850	1,400	1,070	6,515	948	14	4,567
8	Kentucky	25	12,500	24,136	18,435	8,350	8,450	1,635	5,701	1,981	33	18,313
9	Louisiana	3	1,000	6,845	4,435	725	1,150	2,560	2,410	85	13	8,532
10	Maine	42	34,520	117,130	37,440	6,840	13,825	16,775	79,690	6,194	97	49,778
11	Maryland	17	8,870	44,187	22,800	4,850	9,080	8,870	21,387	1,706	67	31,297
12	Massachusetts	101	125,085	461,359	183,505	69,135	47,455	66,915	277,854	24,699	429	279,446
13	Michigan	31	14,150	95,385	52,790	24,700	16,475	11,615	42,595	6,391	104	44,078
14	Minnesota	14	8,300	26,163	13,095	4,100	4,600	4,395	13,068	1,039	27	14,793
15	Mississippi	4	300	2,029	1,721	625	610	486	308	31	10	2,200
16	New Jersey	24	15,500	73,395	28,665	12,200	6,750	9,715	44,730	2,014	73	48,106
17	New York	91	259,533	727,667	375,118	168,633	105,985	100,500	352,549	35,888	602	424,699
18	North Carolina	10	900	5,368	4,325	395	380	3,550	1,043	502	22	6,294
19	Ohio	17	12,800	74,913	40,435	7,355	4,015	29,065	34,478	5,074	112	60,674
20	Oregon	3	.....	4,050	2,550	1,100	550	900	1,500	75	16	8,924
21	Pennsylvania	17	27,400	118,552	55,200	26,125	13,660	15,415	63,352	4,404	119	95,375
22	Rhode Island	10	5,000	27,165	19,280	7,300	4,000	7,980	7,885	661	23	14,625
23	South Carolina	6	6,500	4,020	2,200	500	400	1,300	1,820	754	13	5,286
24	Texas	8	800	8,819	5,760	935	2,200	2,625	3,059	369	29	10,788
25	Virginia	6	500	15,176	9,901	4,380	1,880	3,641	5,275	158	9	5,083
26	Washington	12	4,900	49,370	19,390	3,540	11,200	4,650	29,980	1,699	49	46,625
27	Wisconsin	9	2,850	14,490	7,045	2,725	1,750	2,570	7,445	499	21	6,356
28	All other states (b)	11	3,800	2,966,135	2,954,607	1,371,075	1,001,625	581,907	11,528	957	91	68,431

a Includes officers, firm members, and clerks.

TABLE 6.—DETAILED STATEMENT,

	STATES.	Number of establishments reporting.	CAPITAL.						Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)	
			Value of hired property.	Direct investment.						Employés.	Wages.
				Aggregate.	Plant.			Live assets.			
					Total.	Land.	Buildings.	Machinery, tools, and implements.			
1	The United States	227	$1,122,742	$5,432,218	$3,764,227	$1,080,400	$744,769	$1,939,067	$1,667,991	$253,910	4,798	$3,412,950
2	Alabama	5	4,910	37,750	33,500	500	5,700	27,300	4,250	1,085	85	25,074
3	California	13	22,600	175,706	110,008	10,450	2,500	97,058	65,698	4,059	126	135,156
4	Connecticut	5	6,100	77,300	59,550	29,000	12,000	18,550	17,750	2,849	55	37,920
5	Florida	3	1,500	75,600	73,700	18,000	44,100	11,600	1,900	1,125	34	16,605
6	Illinois	3	1,600	80,284	61,951	54,000	2,850	5,101	18,333	1,832	79	52,466
7	Kentucky	3	.....	28,575	27,300	7,300	1,900	18,100	1,275	1,176	40	20,144
8	Louisiana	5	11,000	312,363	266,403	55,400	17,675	193,328	45,960	12,725	125	90,483
9	Maine	11	9,700	45,535	26,175	10,500	4,400	11,275	19,360	2,195	101	54,318
10	Maryland	9	66,400	153,000	101,400	25,200	10,200	66,000	51,600	22,143	197	125,014
11	Massachusetts	29	107,200	245,889	101,900	43,100	23,100	35,700	143,989	15,401	285	264,648
12	Michigan	10	42,700	465,350	398,300	39,150	300,560	58,590	67,050	9,983	313	193,007
13	New Jersey	21	404,300	847,164	605,725	117,500	109,155	379,070	241,439	64,198	667	512,571
14	New York	67	390,632	1,941,511	1,129,240	372,600	135,500	621,140	812,271	70,469	1,736	1,385,121
15	Ohio	7	5,000	29,593	22,385	11,300	6,550	4,535	7,208	1,138	104	33,419
16	Pennsylvania	9	28,350	70,120	41,620	8,500	5,700	27,420	28,500	4,948	105	69,972
17	Virginia	6	250	246,200	184,700	84,200	31,550	68,950	61,500	2,943	92	58,146
18	Wisconsin	4	.....	185,933	151,525	65,875	7,050	78,600	34,408	2,473	90	55,951
19	All other states (b)	17	20,500	414,345	368,845	127,825	24,270	216,750	45,500	33,168	564	282,935

a Includes officers, firm members, and clerks.
b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are

OF MASTS AND SPARS, BY STATES AND TERRITORIES: 1890.

Cost of materials used.	PRODUCTS. Aggregate value.	Boats built. Total. Number.	Total. Value.	Ships. Number.	Ships. Value.	Fishing. Number.	Fishing. Value.	Pleasure. Number.	Pleasure. Value.	Life. Number.	Life. Value.	Masts and spars. (Value.)	Value of all other products, including repairing.	
$1,151,768	$3,161,526	18,577	$1,419,948	943	$143,587	4,470	$193,228	12,404	$1,011,866	760	$71,267	$400,111	$1,341,467	1
40,559	120,563	593	50,725	71	6,265	348	17,170	144	25,490	30	1,800	35,260	34,578	2
21,202	68,547	244	45,760	108	23,765	9	1,825	122	18,170	5	2,000	225	22,562	3
13,473	45,590	248	18,778	110	9,096	20	2,900	22	1,100	96	5,682	.....	26,812	4
2,702	8,612	70	3,870	2	90	33	1,600	35	2,180	.....	.....	150	4,592	5
27,703	72,250	1,111	71,750	.....	.....	.....	.....	1,111	71,750	.....	.....	.....	500	6
4,491	14,290	826	12,840	.....	.....	.....	.....	826	12,840	.....	.....	.....	1,450	7
23,980	57,600	1,915	46,300	.....	.....	.....	.....	1,915	46,300	.....	.....	.....	11,300	8
2,521	11,459	68	3,134	10	750	25	744	32	1,040	1	600	2,925	5,400	9
52,672	132,911	926	65,181	170	13,901	109	13,627	647	37,653	.....	.....	29,685	38,045	10
29,300	85,670	214	52,460	17	8,400	33	31,450	164	12,610	.....	.....	100	33,110	11
256,213	658,763	5,191	298,291	152	11,485	3,296	72,575	1,723	211,111	20	3,120	190,686	169,786	12
36,531	101,631	1,252	63,748	34	1,870	6	3,550	1,141	54,948	71	3,380	11,957	25,926	13
10,607	34,240	669	29,010	.....	.....	13	870	652	27,865	4	275	.....	5,230	14
730	3,450	37	2,400	6	675	1	900	30	825	.....	.....	150	900	15
77,923	153,652	315	47,907	.....	.....	37	4,055	274	42,852	4	1,000	80,670	25,075	16
341,760	947,779	2,423	341,470	106	10,982	153	17,160	1,742	267,950	422	45,378	14,936	591,373	17
4,705	14,652	54	9,976	3	510	40	7,841	11	1,625	.....	.....	3,067	1,609	18
38,889	124,120	672	30,760	90	4,700	1	250	581	25,810	.....	.....	70	93,290	19
5,550	11,020	38	11,020	4	200	14	1,520	19	9,250	1	50	.....	.....	20
74,301	213,862	337	32,891	9	798	2	1,135	255	24,526	71	6,432	8,833	172,138	21
5,379	24,814	39	9,082	.....	.....	4	1,050	35	8,032	.....	.....	1,317	14,415	22
5,782	15,330	15	4,950	.....	.....	14	4,650	1	300	.....	.....	80	10,300	23
10,722	26,447	223	20,171	1	100	169	4,196	50	15,825	3	50	.....	6,276	24
4,471	10,250	24	1,980	.....	.....	1	400	23	1,580	.....	.....	.....	8,270	25
22,978	78,885	234	63,010	.....	.....	.....	.....	234	63,010	.....	.....	.....	15,875	26
7,493	17,202	416	16,360	.....	.....	102	2,400	314	13,960	.....	.....	.....	842	27
29,131	107,937	423	66,124	50	50,000	40	1,360	301	13,264	32	1,500	20,000	21,813	28

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: District of Columbia, 2; Iowa, 2; Missouri, 2; New Hampshire, 1; Vermont, 2; West Virginia, 2.

VESSEL REPAIRING, BY STATES: 1890.

Cost of materials used.	PRODUCTS. Total value.	Repairs. Sail vessels. Number.	Sail vessels. Value of repairs.	Steam vessels. Number.	Steam vessels. Value of repairs.	Barges. Number.	Barges. Value of repairs.	Canal boats. Number.	Canal boats. Value of repairs.	Other boats, masts, and spars. (Value of repairs.)	Value of all other products, including building.	
$2,553,884	$7,755,832	7,828	$2,411,832	3,637	$3,262,623	2,399	$898,860	3,371	$306,200	$83,387	$882,930	1
9,493	38,701	17	5,562	44	15,948	35	17,191	.....	.....	.....	.....	2
88,059	294,826	667	194,669	54	65,711	31	33,180	.....	.....	.....	1,266	3
73,885	126,364	138	36,600	75	32,600	54	35,650	.....	.....	3,300	18,214	4
3,250	26,699	59	7,531	79	15,220	28	1,790	.....	.....	658	1,500	5
25,071	99,834	126	36,654	101	34,229	25	2,661	51	26,290	.....	.....	6
6,029	33,295	.....	.....	32	19,559	45	10,386	.....	.....	.....	3,350	7
38,455	151,966	49	22,884	107	105,300	52	23,582	.....	.....	.....	200	8
21,991	94,243	510	79,400	36	3,200	1	93	.....	.....	900	10,650	9
37,009	303,497	484	216,000	116	74,900	23	3,200	4	600	6,731	2,066	10
117,061	456,099	1,015	235,801	237	129,844	67	28,554	18	3,000	27,400	31,500	11
118,297	445,438	99	87,000	161	255,300	242	67,964	27	5,174	.....	30,000	12
624,721	1,534,269	946	495,553	518	435,233	728	264,421	635	60,067	5,055	264,940	13
1,022,755	2,984,783	2,485	747,035	1,423	1,472,356	531	178,451	2,397	170,257	14,303	402,381	14
38,386	99,865	37	35,000	56	45,000	1	300	52	5,415	12,000	2,150	15
33,548	129,546	4	4,000	.....	.....	286	69,977	138	15,397	2,600	37,572	16
39,929	176,300	397	82,000	173	61,000	75	3,000	14	3,000	9,600	17,700	17
61,991	132,273	180	26,550	137	47,332	1	1,500	.....	.....	.....	56,891	18
193,954	627,834	615	99,593	288	449,891	174	66,960	35	8,000	840	2,550	19

distributed as follows: Georgia, 2; Iowa, 2; Minnesota, 1; Mississippi, 2; Missouri, 2; North Carolina, 1; Oregon, 2; Rhode Island, 2; Tennessee, 1; Texas, 1; West Virginia, 1.

TABLE 7.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYES AT

	STATES AND TERRITORIES.	Number of establishments reporting.	AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS.											
			Aggregates.		Officers and firm members actively engaged in the industry or in supervision.						Clerks.					
					Males above 16 years.			Females above 15 years			Males above 16 years.			Females above 15 years.		
			Average number.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.
1	The United States	1,010	25,934	$16,028,847	825	$26.30	$957,536	1	$48.08	$2,500	287	$16.59	$230,871	10	$7.74	$3,963
2	Alabama	5	85	25,074	1	37.50	150				2	11.54	600			
3	California	33	1,792	1,468,989	14	86.54	58,846				1	25.00	1,300			
4	Connecticut	29	652	376,122	26	22.59	26,344				2	15.00	1,560			
5	Delaware	11	1,802	899,151	24	62.83	78,100				17	21.39	18,826	2	12.00	1,248
6	District of Columbia	4	14	8,410												
7	Florida	16	76	33,621	6	15.61	3,450				1	9.35	290			
8	Georgia	4	118	61,134	6	21.26	6,020									
9	Illinois	10	331	187,021	9	21.73	9,126				6	18.97	5,596	1	8.33	433
10	Indiana	11	551	253,733	7	21.39	5,754				1	20.00	1,040			
11	Iowa	5	48	26,926	3	13.62	1,825									
12	Kentucky	29	88	41,577	26	14.77	15,612									
13	Louisiana	13	192	119,555	12	21.93	11,691				5	16.41	3,413			
14	Maine	85	1,539	843,715	79	18.79	60,153				7	14.08	4,392	3	7.54	1,176
15	Maryland	34	1,075	649,342	18	20.95	17,517				14	19.09	11,342			
16	Massachusetts	147	1,188	865,928	101	20.01	89,833				11	13.47	7,128			
17	Michigan	62	2,284	1,267,102	70	21.48	67,287				22	13.48	14,370	1	5.08	244
18	Minnesota	20	319	178,608	10	22.37	8,724				1	23.08	1,200			
19	Mississippi	9	47	15,742	2	17.77	764									
20	Missouri	5	357	159,224	6	30.55	7,020				5	22.33	4,355			
21	New Jersey	62	1,186	890,789	55	28.26	59,977				15	17.84	13,522			
22	New York	217	5,529	3,810,394	176	28.41	227,518	1	48.08	2,500	56	17.42	47,565	2	6.62	662
23	North Carolina	16	138	50,484	10	16.59	7,184				2	12.62	1,312			
24	Ohio	44	2,822	1,521,212	51	28.21	61,972				92	14.59	66,995			
25	Oregon	14	208	135,222	7	21.02	6,097				2	26.79	1,500			
26	Pennsylvania	32	2,022	1,215,876	29	41.80	58,321				18	19.15	17,775			
27	Rhode Island	15	200	133,453	16	22.63	15,980									
28	South Carolina	8	83	47,286	7	19.81	6,360									
29	Texas	9	31	11,788	2	11.15	918									
30	Vermont	3	14	4,572	2	12.00	312									
31	Virginia	18	510	345,454	13	16.14	9,168				2	7.88	820			
32	Washington	17	186	97,216	14	20.81	12,361				1	13.46	350			
33	West Virginia	4	57	17,550	2	8.97	700									
34	Wisconsin	16	311	205,005	21	26.78	22,586				4	28.82	5,620	1	3.85	200
35	All other states (a)	3	79	61,572												

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 1; New Hampshire, 1; Tennessee, 1.

THE DIFFERENT WEEKLY RATES OF PAY, SHIPBUILDING, BY STATES AND TERRITORIES: 1890.

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Operatives and skilled.									Unskilled.						Piecework.		
Males above 16 years.			Females above 15 years.			Children.			Males above 16 years.			Children.					
Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Total wages.	
17,883	$13.97	$11,781,165	7	$6.24	$2,272	33	$3.91	$5,714	5,616	$8.85	$2,431,804	141	$2.83	$20,630	1,131	$592,392	1
43	18.91	17,061							31	7.02	4,654				8	2,609	2
1,388	17.08	1,191,509							338	11.37	199,114				51	18,220	3
468	13.67	277,545				3	4.27	500	143	9.05	62,653				10	7,520	4
1,149	10.37	607,154	6	6.41	2,000	1	3.85	200	461	7.14	170,318	140	2.83	20,605	2	700	5
14	16.17	8,410															6
60	11.54	27,809							2	5.32	346				7	1,726	7
86	11.47	45,734							26	7.68	9,320						8
282	12.06	163,676				16	3.92	2,496	17	7.03	5,604						9
387	11.72	202,667							156	6.37	44,272						10
34	13.52	20,976							11	9.07	4,125						11
26	14.02	11,791							36	11.89	14,174						12
119	15.73	76,645							46	9.47	19,494				10	8,312	13
1,269	12.38	713,449							152	9.01	58,476	1	1.92	25	28	6,044	14
962	14.18	598,121				2	3.71	338	48	10.80	20,824				11	1,200	15
981	15.55	734,716							28	9.08	11,841				67	22,410	16
1,263	12.58	740,300	1	5.23	272	10	4.00	2,080	691	9.65	329,598				226	112,951	17
83	14.05	46,219							225	10.47	122,465						18
40	11.61	12,978							3	9.52	1,200				2	800	19
151	11.39	72,363							45	9.16	15,480				150	60,000	20
992	15.50	750,172							108	9.53	50,894				16	16,224	21
3,732	15.57	2,791,576				1	2.33	100	1,470	9.14	667,524				91	72,949	22
83	11.69	35,308							6	6.92	2,160				37	4,520	23
1,540	13.05	899,508							922	8.45	388,587				217	104,150	24
175	16.90	115,205							24	10.53	12,420						25
1,318	12.33	826,216							469	6.81	164,877				188	148,687	26
184	12.56	117,473															27
54	12.54	35,200							17	6.06	5,356				5	370	28
24	9.22	7,870													5	3,000	29
12	11.70	4,260															30
484	14.55	332,626							11	5.86	2,840						31
69	18.97	52,689							102	10.61	31,816						32
50	10.09	16,100							5	5.77	750						33
265	13.30	167,559							20	9.39	9,240						34
76	16.25	60,280							3	8.50	1,292						35

TABLE 7.—CLASSIFICATION OF EMPLOYÉS AND WAGES AND AVERAGE NUMBER OF EMPLOYÉS AT THE

	STATES AND TERRITORIES.	WEEKLY RATE OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)											
		Males above 16 years.											
		Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.
1	The United States	24,611	595	359	567	1,482	1,538	2,363	3,060	5,330	7,178	1,595	544
2	Alabama	77	.....	3	9	18	1	9	.....	2	10	24	1
3	California	1,741	65	59	43	.....	47	5	25	349	693	289	166
4	Connecticut	639	1	2	5	7	39	70	71	178	248	8	10
5	Delaware	1,651	162	18	31	428	106	133	201	338	190	14	30
6	District of Columbia	14	.....	.....	.....	.....	.....	.....	.....	.....	14	.....	.....
7	Florida	69	2	4	.....	11	.....	10	8	17	11	6	.....
8	Georgia	118	.....	5	2	8	13	.....	68	6	11	5	.....
9	Illinois	314	1	14	8	5	13	18	114	43	78	14	6
10	Indiana	551	9	10	56	103	8	20	38	263	33	8	3
11	Iowa	48	.....	2	.....	.....	5	12	7	10	10	2	.....
12	Kentucky	88	.....	.....	1	10	1	6	12	19	35	3	1
13	Louisiana	182	8	1	3	2	.....	42	5	9	101	4	7
14	Maine	1,507	1	21	23	22	81	142	397	416	333	53	18
15	Maryland	1,062	28	28	27	35	71	96	141	153	428	38	17
16	Massachusetts	1,121	1	7	4	12	16	28	110	195	525	199	24
17	Michigan	2,046	25	30	18	102	203	407	124	741	347	30	19
18	Minnesota	319	.....	.....	1	1	8	128	7	129	35	3	7
19	Mississippi	45	6	.....	.....	6	.....	3	2	14	14	.....	.....
20	Missouri	207	.....	1	15	.....	18	30	101	7	21	6	8
21	New Jersey	1,170	9	7	15	46	28	61	82	257	455	185	25
22	New York	5,434	57	27	69	65	455	659	677	945	1,840	539	101
23	North Carolina	101	2	.....	6	16	2	10	16	24	22	2	1
24	Ohio	2,605	32	43	132	249	212	220	518	597	549	27	26
25	Oregon	208	.....	4	.....	13	.....	7	10	59	72	39	4
26	Pennsylvania	1,834	96	26	59	294	142	154	146	370	468	37	42
27	Rhode Island	200	1	.....	.....	1	1	33	60	50	47	2	5
28	South Carolina	78	3	.....	16	.....	.....	1	43	2	8	3	2
29	Texas	26	5	2	.....	.....	2	3	4	6	1	3	.....
30	Vermont	14	.....	.....	.....	.....	.....	5	3	6	.....	.....	.....
31	Virginia	510	11	36	12	3	43	4	15	67	311	6	2
32	Washington	186	69	1	.....	4	5	.....	1	3	59	33	11
33	West Virginia	57	1	5	5	6	6	14	18	.....	1	1	.....
34	Wisconsin	310	.....	3	7	15	9	32	36	49	144	7	8
35	All other states	79	.....	.....	.....	.....	3	1	.....	6	64	5	.....

a In comparing the weekly rates of wages and the number of employés at each rate with the average weekly earnings presented in the first part of this table, it must be remembered that it is not practicable to obtain true average weekly earnings from this table of weekly rates, because the term of employment varies for employés at the respective rates.

DIFFERENT WEEKLY RATES OF PAY, SHIPBUILDING, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATE OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued. (b)

Females above 15 years.									Children.			
Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$12 and over but under $15.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	
18	1	3	5	3	2	1	2	1	174	169	5	1
												2
												3
									3	3		4
8			4	2			2		141	141		5
												6
												7
												8
1					1				16	16		9
												10
												11
												12
												13
3		1			1	1			1	1		14
									2	2		15
												16
2		2							10	5	5	17
												18
												19
												20
												21
3			1	1				1	1	1		22
												23
												24
												25
												26
												27
												28
												29
												30
												31
												32
												33
1	1											34
												35

SALT.

SALT.

This report on the manufacture of salt in the United States during the census year ending May 31, 1890, comprehends the manufacture of salt by artificial heat, by solar evaporation, and from rock salt. Only those establishments are included which reported a product of $500 or more in value.

The following comparative summary presents the results obtained at the censuses of 1880 and 1890, under the principal heads of inquiry, with the percentage of increase or decrease during the decade:

COMPARATIVE SUMMARY, SALT MANUFACTURE: 1880 AND 1890.

ITEMS.	1880	1890	Percentage of increase.
Number of establishments reporting	268	200	a25.37
Capital	$8,225,740	$13,437,749	63.36
Miscellaneous expenses	(b)	$674,183	.....
Average number of employés (aggregate)	4,289	4,455	3.87
Total wages	$1,260,023	$1,782,491	41.46
Officers, firm members, and clerks:			
Average number	(c)	200	.....
Total wages	(c)	$189,049	.....
All other employés:			
Average number	(c)	4,255	.....
Total wages	(c)	$1,593,442	.....
Cost of materials used	$2,074,049	$1,820,770	a11.92
Value of products	$4,829,566	d$5,484,618	13.56
Bushels of salt produced	29,805,298	52,034,300	74.58

a Decrease. b Not reported. c Not reported separately. d Includes products other than salt to the value of $43,315.

From the above statement it appears that during the past decade there has been a decrease in the number of establishments and cost of materials used, while the value of product has increased 13.56 per cent, and the quantity of salt produced 74.58 per cent.

No preceding census inquiry has comprehended data relating to cost of manufacture other than statistics of wages and materials. The data presented in this report for 1890 are intended to embrace the entire cost of production other than allowance for depreciation of plant and interest on capital. The difference between the cost and value shown must not, however, be taken as indicating the net profit or earnings for capital, because these statistics contain no information relating to cost of selling, mercantile losses, or depreciation of plant. The census inquiry was intended simply to ascertain the true relation which capital, expenses, wages, and cost of materials bear to the value at the works of the products of manufacturing industry, excluding all cost or expense pertaining to the mercantile portion of the business.

The decrease of 68 in the number of establishments during the decade from 1880 to 1890 is due in a measure to the abandonment of salt making from sea water on the Atlantic coast, and the consolidation of salt manufacturing plants in the several states, notably in California. When two or more salt manufacturing plants owned by the same corporation, firm, or individual are located in the same county or city, they are counted in the tabulations of this office as one establishment.

Owing to changes in the form of the inquiry adopted for the census of 1890 the data reported for all the items, when compared with those of the Tenth Census, should not be considered as indicating the exact increase or decrease during the decade. These changes occur principally in the questions concerning capital and employés and wages.

It is believed that the form of inquiry concerning capital used at the Eleventh Census has served to more fully develop the true amount of capital than the preceding census inquiries. The form of questions used at the census of 1880 respecting capital was as follows: "Capital (real and personal) invested in the business". The inquiry at the Eleventh Census was more in detail and required under the title "Value of plant", (1) the amount invested in land, (2) value of buildings, (3) value of machinery, tools, and implements. Under the title "Live capital" was required, (1) value of raw materials on hand, (2) stock in process and finished products on hand, (3) cash on hand, bills receivable, unsettled ledger accounts, and sundries not included in any of the foregoing items.

EMPLOYÉS AND WAGES.

In comparing the statistics of employés and wages reported at the two censuses, it should be remembered that the schedule of inquiry used at the Eleventh Census provided for a more thorough exposition of the different classes of employés and the wages paid. The classification of employés made at the Tenth Census was that of males above 16 years, females above 15 years, and children. The classification used at the Eleventh Census was as follows: (1) operatives, engineers, and other skilled workmen, overseers and foremen or superintendents (not general superintendents or managers), (2) officers or firm members, (3) clerks, (4) watchmen, laborers, teamsters, and other unskilled workmen, (5) pieceworkers (not included in the foregoing). A further division of the above classes into males above 16 years, females above 15 years, and children was required. The questions also required the average number of males, females, and children to be reported at specified weekly rates of wages.

Of the 4,455 employés reported for the manufacture of salt 200 are reported as officers, firm members, and clerks, receiving $189,049 as wages, or 4.49 per cent of the total number of employés and 10.61 per cent of the total wages. Considering the skilled and unskilled employés as one class, there were 3,708 reported as receiving $1,422,242 as wages, or 83.23 per cent of the total number and 79.79 per cent of the total wages. There were 547 pieceworkers reported, with $171,200 as wages, or 12.28 per cent of the total number and 9.60 per cent of the total wages.

The proportion of males, females, and children, respectively, in the whole number of employés is as follows:

AVERAGE NUMBER AND PER CENT OF MALES ABOVE 16 YEARS, FEMALES ABOVE 15 YEARS, AND CHILDREN EMPLOYED, SALT MANUFACTURE: 1890.

CLASSES.	Average number.	Percentage of total.
Total	4,455	100.00
Males above 16 years	4,252	95.44
Females above 15 years	151	3.39
Children	52	1.17

The following statement presents the average number of employés at specified weekly rates of wages. This statement includes all classes of employés except pieceworkers.

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK, SALT MANUFACTURE: 1890.

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.			
	Aggregate.	Males above 16 years.	Females above 15 years.	Children.
Total	3,906	3,795	78	33
Under $5	76	51	8	17
$5 and over but under $6	61	15	33	13
$6 and over but under $7	224	191	28	5
$7 and over but under $8	529	520	9	.....
$8 and over but under $9	681	681	.....	.....
$9 and over but under $10	946	946	.....	.....
$10 and over but under $12	718	718	.....	.....
$12 and over but under $15	383	383	.....	.....
$15 and over but under $20	145	145	.....	.....
$20 and over but under $25	71	71	.....	.....
$25 and over	74	74	.....	.....

MATERIALS.

In the manufacture of salt by artificial heat fuel is the principal item of expense classed among materials used. The other items of cost shown under this head in the tables as "All other materials" are packages, lime, soda ash, lumber for the repair of covers, materials for the repair of kettles, pans, and grainers, and other miscellaneous materials. Fuel, lime, and soda ash are the only articles enumerated under materials that enter into and form a part of the product. The total cost of all the items classed as materials was $1,826,770, or 42.65 per cent of the total cost of manufacture. Of this amount $745,917, or 17.42 per cent of the total cost of manufacture, was expended for fuel. The amount reported as paid for fuel does not represent the value of all fuel consumed in the manufacture of salt, as in many establishments, especially in the state of Michigan, the sawdust and waste steam of the sawmill are consumed in the salt plant, no value being reported for such fuel or for the fuel used in generating the waste steam.

PRODUCTS.

The total quantity of salt manufactured during the census year was 52,034,300 bushels, valued at $5,441,303, with other products valued at $43,315, as compared with 29,805,298 bushels valued at $4,829,566 in 1880, being an increase in quantity of salt manufactured of 74.58 per cent and value of products of 13.56 per cent. The salt reported at both censuses includes that manufactured by artificial heat in kettles, pans, settlers, and grainers; salt manufactured by solar evaporation in vats or ponds covered and uncovered, also rock salt mined and ground. All other products shown for 1890, with a value of $43,315, consisted principally of bromine, there having been manufactured 167,550 pounds valued at $40,395.

The following comparative statement shows the quantities of each kind of salt reported at both censuses, with the percentage that each constitutes of the total quantity manufactured:

COMPARATIVE STATEMENT, QUANTITY OF SALT MANUFACTURED AND PERCENTAGE EACH KIND IS OF TOTAL: 1880 AND 1890.

KIND OF SALT.	1880		1890	
	Quantity. (Bushels.)	Percentage of total.	Quantity. (Bushels.)	Percentage of total.
Total	29,805,298	100.00	52,034,300	100.00
Rock salt	312,000	1.05	7,066,405	13.58
Solar salt	4,517,776	15.16	7,216,312	13.87
Salt made by boiling process	24,975,522	83.79	37,751,583	72.55

The states in which salt is reported as having been manufactured during the census year are arranged in the following statement in the order of their importance, according to the quantity of salt produced. The number of bushels manufactured in each state is shown; also the percentage that the product of each state is of the total product for the United States.

QUANTITY AND PER CENT OF PRODUCT, BY STATES AND TERRITORIES, SALT MANUFACTURE: 1890.

STATES AND TERRITORIES.	Number of bushels of salt manufactured.	Percentage of total product.
The United States	52,034,300	100.00
Michigan	18,645,553	35.83
New York	16,131,251	31.00
Kansas	5,703,695	10.96
Utah	3,132,143	6.02
Ohio	2,047,569	3.94
West Virginia	1,427,306	2.74
California	1,276,641	2.45
Pennsylvania	862,000	1.66
Nevada	126,249	0.24
All other states (a)	2,681,593	5.16

a Includes Illinois, Kentucky, Louisiana, Massachusetts, Texas, and Virginia.

The following statement presents by states and territories the number of establishments reporting and the number of wells and mines; also the number of establishments reported as engaged in the manufacture of rock salt, of salt by solar evaporation, and of salt by artificial heat, with the characteristics and equipment of the plants for evaporation of the brine, the source of brine, and the number of bushels of salt obtained from each source:

ESTABLISHMENTS, WELLS, AND MINES, PROCESSES OF MANUFACTURE AND QUANTITY OF SALT, SALT MANUFACTURE, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	Number of establishments reporting.	Number of wells.	ROCK SALT.		SOLAR EVAPORATION.			ARTIFICIAL HEAT.			SALT MANUFACTURED. (BUSHELS.)		
			Number of establishments.	Number of mines.	Number of establishments.	Covers. Number.	Covers. Area. (Square feet.)	Number of establishments.	Number of blocks.	Number of kettles, boilers, pans, grainers, jacketed kettles, or vacuum pans.	From sea or bay water.	From inland lakes or natural deposits.	From subterranean brines.
The United States	200	424	4	4	47	40,143	10,828,412	150	186	a3,418	1,065,141	10,538,011	40,431,148
California	9	.....	.....	.....	9	.....	.....	.....	.....	.....	1,061,641	215,000	.....
Kansas	23	28	1	1	1	545	139,520	21	21	48	.....	89,286	5,614,709
Michigan	b81	240	.....	.....	1	2,600	104,000	81	92	a477	.....	.....	18,645,553
Nevada	3	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	126,249	.....
New York	50	83	1	1	23	36,588	10,469,692	26	46	1,926	.....	5,444,190	10,687,061
Ohio	9	29	.....	.....	.....	.....	.....	9	9	311	.....	.....	2,047,569
Pennsylvania	3	5	.....	.....	.....	.....	.....	3	3	22	.....	.....	862,030
Utah	9	.....	1	1	8	.....	.....	.....	.....	.....	.....	3,132,143	.....
West Virginia	5	22	.....	.....	.....	.....	.....	5	5	a149	.....	.....	1,427,306
All other states (c)	8	17	1	1	2	410	115,200	5	10	485	3,500	1,531,143	1,146,950

a Includes 3 settlers and 8 cisterns in Michigan and 4 settlers in West Virginia.

b One establishment manufactures salt by both solar evaporation and artificial heat.

c Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Illinois, 1; Kentucky, 2; Louisiana, 1; Massachusetts, 1; Texas, 2; Virginia, 1.

SALT MANUFACTURE, BY STATES.

There were 884,743 bushels of salt reported as manufactured in California at the census of 1880, as compared with 1,276,641 bushels reported at the census of 1890, an increase of 44.30 per cent. Table 1 of this report shows a decrease in the number of establishments from 1880 to 1890; this is due not to an actual decrease in the number of salt manufacturing plants but to the consolidation of several establishments under one firm. The entire product of the state was manufactured by solar evaporation in uncovered ponds or vats. The center of activity was in Alameda county, on San Francisco bay, where the manufacture was carried on by the introduction of bay water into uncovered ponds with wood or clay bottoms. A similar method was used at Otay, in San Diego county, where there was 1 establishment in operation. The only exception to the use of sea water was at Salton, in San Diego county, in the interior of the southern part of the state, where the salt forms a natural deposit and is gathered from the surface of the desert and ground and refined for use.

There was but 1 establishment engaged in salt manufacture in Illinois during the census year. This establishment was located at St. John, in Perry county. The brine, which is obtained from 7 wells, each 1,000 feet in depth, shows a strength of 33° salinometer. The evaporation is by the pan and grainer process, the evaporating plant consisting of 56 pans and grainers.

Kansas during the census year was the third state in order of production. The total product reported for the state consisted of 5,703,995 bushels, as compared with 13,000 bushels at the Tenth Census. The brine supply was obtained from 28 wells having an average depth of 798 feet; its strength in most instances reached the point of 100° salinometer, going as low, however, as 34° salinometer in the case of 1 establishment manufacturing salt by solar evaporation; the brine evaporating surface for this establishment consisted of 545 covers, with an area of 139,520 square feet. There were 48 pans and grainers reported for the state as used for the concentration of brine by direct heat and steam. But 1 establishment, located at Kingman, Kingman county, was reported as mining rock salt during the census year; its operations were conducted in a bed 800 feet below the surface and 12 feet in thickness, its extent at the time reported being unknown. Fuel to the value of $195,286 was consumed during the census year for evaporation and power-producing purposes.

The brine used in the manufacture of salt in the state of Kentucky was obtained from 6 wells, ranging in depth from 528 to 820 feet, the average depth being 605 feet. The average strength of brine was 33° salinometer. The evaporation was by artificial heat in boilers, pans, and grainers.

The conditions of salt manufacture in Louisiana remain practically unchanged since 1880. There was but 1 establishment reported for the state, and it was engaged in the mining and grinding of rock salt. The operations were conducted on Petite Anse, or Avery island, Iberia parish, in a bed of solid salt.

The manufacture of salt in Massachusetts shows a marked decrease during the last decade, the entire product for 1890 being made by 1 establishment manufacturing salt from bay water by solar evaporation. The number of covers in use was 160, with an area of 43,200 square feet. There were 3 other establishments in operation, but their combined product was less than $500 in value, and they are not included in this report.

In the production of salt and the number and productive capacity of its establishments, Michigan holds first place. The product during the census year was 18,645,553 bushels, or 35.83 per cent of the output for the United States. The increase shown for 1890, when compared with 1880, was 6,219,668 bushels, or 50.05 per cent. With the exception of 1 establishment that evaporated brine by the use of both solar and artificial heat, the pan and grainer process was used entirely. As reported, the equipment of plants for evaporating by artificial heat was 477 pans and grainers (including 3 settlers and 8 cisterns), and for solar evaporation 2,600 covers, having an area of 104,000 square feet. The manufacture is conducted in the counties of Bay, Huron, Iosco, Manistee, Mason, Midland, Saginaw, and St. Clair. Brine is obtained from wells, 240 in number, varying in depth from 715 to 2,900 feet, with an average depth of about 1,050 feet. The density of the brine ranges from 62° to 105° salinometer. In the majority of cases in this state the manufacture of salt is carried on in close connection with the operation of lumber and saw mills, and it was difficult for manufacturers to make separate returns for both branches of industry. By this connection fuel was obtained at an extremely low cost, the exhaust steam and refuse sawdust from the mills being used for this purpose. The total cost of fuel for the entire state was only $138,882.

The salt manufactured in Nevada is entirely a product of solar evaporation. The brine is obtained in some instances by means of shallow wells or ditches, and is conducted into uncovered clay-bottom vats for evaporation. The production has decreased from 182,408 bushels in 1880 to 126,249 in 1890, or 30.79 per cent. The product of this state is utilized largely in the chlorination treatment of the ores of precious metals.

New York is the second state in rank of salt production. The number of bushels manufactured during the census year was 16,131,251, as compared with 8,748,203 bushels in 1880, an increase of 84.40 per cent.

The manufacture is carried on in the following counties: Genesee, Livingston, Onondaga, and Wyoming. At the Tenth Census Onondaga county was the only one in the state for which returns of salt manufacture were made. Since then the industry has developed in the other counties named.

The Onondaga reservation, which includes all salt manufacturing establishments in and adjacent to the city of Syracuse, is under a strict system of inspection by state officers, the wells being the property of the state, and salt manufacturers are charged for brine used at the rate of 1 cent per bushel of salt manufactured. There were 40 wells in this district in operation during the census year.

There were 83 wells reported for the entire state with an average depth of 1,100 feet, furnishing a brine that ranged in strength from an average of 70° salinometer in Onondaga county to 90° and the point of complete saturation in the other counties named. Evaporation is by the solar process and by artificial heat in Onondaga county, while in Genesee, Livingston, and Wyoming counties the system of evaporation by direct heat and steam is followed exclusively. The equipment for the purpose of evaporation in the whole state consisted of 1,926 kettles, pans, and grainers, and 36,588 covers, with an area of 10,469,692 square feet.

The mining of rock salt is conducted at Piffard, in Livingston county, in 2 beds at a depth of 1,100 feet below the surface, 80 feet in thickness, and in area about 800 acres.

The production of salt in Ohio has decreased from 2,650,301 bushels in 1880 to 2,047,569 in 1890, or 22.74 per cent. This decrease is due to the abandonment of salt manufacturing in Athens, Columbiana, Guernsey, Morgan, and Muskingum counties, where it was carried on to some extent in 1880. Salt was manufactured in Meigs and Tuscarawas counties during the census year, Pomeroy, Meigs county, being the point of greatest activity in production. Brine was supplied by 27 wells in Meigs county, ranging in depth from 1,100 to 1,300 feet, and in Tuscarawas by 2 wells, each 900 feet in depth. The evaporation was entirely by direct heat and steam, there having been in operation for this purpose 311 pans and grainers. The fuel consumed, consisting largely of slack coal, cost $49,513.

The manufacture of salt in Pennsylvania during the census year, as reported to this office, was conducted by 3 establishments in Allegheny county, reporting an annual product of 862,000 bushels, as compared with 16 establishments, having an annual product of 851,450 bushels, at the census of 1880. The process of manufacture was almost entirely by grainers, the pan process being used to a limited extent. Natural gas was used exclusively for fuel. The brine was obtained from 5 wells from 1,500 to 2,000 feet in depth, and possessed an average strength of 36° salinometer. There were 92,490 pounds of bromine manufactured from the bittern of the salt works.

The only salt deposits in Texas reported as worked during the census year were in Mitchell and Van Zandt counties. The brine which was obtained from 2 wells, 1 in Mitchell county, 1,100 feet in depth, and 1 in Van Zandt county, 500 feet in depth, was a saturated solution of 100° salinometer. The Mitchell county plant evaporated its brine by the solar process, having in use 250 covers, with a surface area of 72,000 square feet; the works in Van Zandt had 2 blocks of 2 evaporating pans each.

The highly concentrated brine of Great Salt lake, in Utah, showing a strength of 65° salinometer, is the foundation of salt manufacture in that territory, the entire product, with the exception of 1,786 bushels of rock salt, having been evaporated from its waters. The production has increased from 483,800 bushels in 1880 to 3,132,143 bushels in 1890, or 547.40 per cent. The salt from the waters of the lake is made entirely by solar evaporation, the water being pumped into ponds, and after evaporation it is gathered and shipped, that portion, by far the larger, which is intended for the chlorination of ores, in its unrefined condition, that for table and dairy use being dried and refined.

There are 2 rock salt deposits in the territory, 1 at Nephi city, Juab county, the product of which during the census year was valued at less than $500, and is therefore not included in this report. The other at Salina, Sevier county, which occurs as a bed at a shallow depth of 8 feet below the surface. The area of this bed is 20 acres, from 5 to 10 feet in thickness, and is worked by shafts and drifts.

The salt manufactured in Virginia during the census year was the product of 1 establishment using the kettle process of evaporation by direct heat, the plant consisting of 5 blocks of 420 kettles. The brine, which was obtained from 2 wells, 252 and 267 feet in depth, was from 80° to 90° salinometer.

With the exception of an establishment at Malden, Kanawha county, the manufacture of salt in West Virginia is confined to Mason county, where the industry is conducted under very similar conditions to those at Pomeroy, Ohio, on the opposite side of the Ohio river, the brine deposit being the same. In this state there are 22 wells of an average depth of 931 feet, furnishing a brine of from 30° to 40° salinometer. Evaporation is by the pan and grainer process, and there were reported in use for this purpose 149 pans and grainers, including 4 settlers. The fuel employed was bituminous coal and natural gas.

The statistical tables accompanying this report are as follows:

Table 1 is a comparative statement by state totals, showing the items of inquiry common to both censuses.

Table 2 is a detailed statement of the data concerning the manufacture of salt reported at the Eleventh Census; it shows the various subdivisions of capital, miscellaneous expenses, employés and wages, materials used, and products.

The employés are classified as (1) officers or firm members; (2) clerks; (3) skilled workmen; (4) unskilled workmen; with the average number of males above 16 years, females above 15 years, and children, respectively, and the average weekly earnings per employé, also the total wages for each of the respective classes, and the

number of pieceworkers and their total wages. This table also shows the average number of males, females, and children employed at specified weekly rates of wages.

The questions concerning employés and wages called for the "Average number employed during the year", that is, the average number having continuous employment for the full time reported by individual establishments. Upon this basis the computations are made to obtain the "Average weekly earnings". The number of employés reported for each establishment is multiplied by the number of weeks the establishment was in operation; the result is the number of weeks required for 1 employé to perform the labor. Aggregating such results of individual reports, the number of weeks required for 1 employé to perform the entire labor is obtained. This number, used as a divisor for the total wages reported, produces the average weekly earnings.

TABLE I.—COMPARATIVE STATEMENT, SALT MANUFACTURE,

	STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.				
					Aggregates.		Males above 16 years.	Females above 15 years.	Children.
					Average number.	Total wages.			
1	The United States	1880	268	$8,225,740	4,289	$1,260,023	4,125	20	144
2		1890	200	13,437,749	4,455	1,782,491	4,252	151	52
3	California	1880	25	375,650	188	50,620	188	.....	.....
4		1890	9	362,135	173	81,525	173	.....	.....
5	Kansas	1880	1	6,000	2	700	2	.....	.....
6		1890	23	781,085	449	187,660	433	16	.....
7	Kentucky	1880	3	20,500	34	8,750	34	.....	.....
8		b1890	.....	.....	.....	.....	.....	.....	.....
9	Louisiana	1880	1	250,000	45	11,000	45	.....	.....
10		b1890	.....	.....	.....	.....	.....	.....	.....
11	Massachusetts	1880	5	9,000	8	1,030	8	.....	.....
12		b1890	.....	.....	.....	.....	.....	.....	.....
13	Michigan	1880	86	2,147,209	1,468	541,852	1,416	.....	52
14		1890	81	3,195,120	1,629	578,614	1,527	61	41
15	Nevada	1880	7	45,300	36	9,688	31	3	2
16		1890	3	23,500	22	7,210	22	.....	.....
17	New York	1880	69	2,286,081	1,012	274,087	962	11	39
18		1890	50	7,171,126	1,245	544,326	1,162	74	9
19	Ohio	1880	25	832,600	453	105,261	449	2	2
20		1890	9	425,731	260	87,079	260	.....	.....
21	Pennsylvania	1880	16	234,500	137	52,047	131	.....	6
22		1890	3	157,413	59	38,200	59	.....	.....
23	Texas	1880	3	92,000	19	8,150	17	1	1
24		b1890	.....	.....	.....	.....	.....	.....	.....
25	Utah	1880	10	13,400	73	20,932	62	3	8
26		1890	9	238,136	180	53,858	178	.....	2
27	Virginia	1880	1	1,000,000	76	14,219	76	.....	.....
28		b1890	.....	.....	.....	.....	.....	.....	.....
29	West Virginia	1880	15	910,500	736	160,227	702	.....	34
30		1890	5	361,966	165	67,548	165	.....	.....
31	Wyoming	1880	1	3,000	2	1,460	2	.....	.....
32		c1890	.....	.....	.....	.....	.....	.....	.....
33	All other states	b1890	8	721,537	273	136,471	273	.....	.....

a Includes "All other products" to the value of $43,315.

b Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Illinois, 1; Kentucky, 2; Louisiana, 1; Massachusetts, 1; Texas, 2; Virginia, 1.

BY STATES AND TERRITORIES: 1880 AND 1890.

COST OF MATERIALS USED.			PRODUCTS.					
Total.	Fuel.	All other materials.	Total value.	Salt. (Bushels.) Total.	Rock.	Solar.	Boiling process.	
$2,074,049	$916,100	$1,157,949	$4,829,566	29,805,298	312,000	4,517,776	24,975,522	1
1,826,770	745,917	1,080,853	a5,484,618	52,034,300	7,066,405	7,216,312	37,751,583	2
19,415	376	19,119	121,050	884,743	.....	878,393	6,350	3
20,087	2,027	18,040	166,722	1,276,641	.....	1,276,641	.....	4
710	.....	710	5,700	13,000	.....	13,000	.....	5
352,574	195,286	157,288	697,802	5,703,995	89,286	20,000	5,594,709	6
9,008	3,408	5,600	21,950	83,000	.....	.....	83,000	7
.....	.....	.....	.....	.....	.....	.....	.....	8
.....	.....	.....	56,160	312,000	312,000	.....	.....	9
.....	.....	.....	.....	.....	.....	.....	.....	10
20	.....	20	3,800	9,575	.....	9,575	.....	11
.....	.....	.....	.....	.....	.....	.....	.....	12
1,009,733	377,939	631,794	2,271,913	12,425,885	.....	153,500	12,272,385	13
784,012	138,882	645,130	2,046,975	18,645,553	.....	64,286	18,581,267	14
5,800	.....	5,800	92,640	182,408	.....	182,408	.....	15
90	90	.....	21,491	126,249	.....	126,249	.....	16
507,020	240,112	266,908	1,107,760	8,748,203	.....	2,777,000	5,971,203	17
443,002	252,776	190,826	1,563,228	16,131,251	5,444,190	2,483,479	8,203,582	18
202,543	112,337	90,206	363,791	2,650,301	.....	.....	2,650,301	19
83,552	49,513	34,039	212,541	2,047,569	.....	.....	2,047,569	20
74,047	37,141	36,906	177,415	851,450	.....	.....	851,450	21
27,445	15,592	11,853	156,398	862,000	.....	.....	862,000	22
9,100	6,400	2,700	29,700	50,600	.....	16,600	34,000	23
.....	.....	.....	.....	.....	.....	.....	.....	24
4,000	480	3,520	60,280	483,800	.....	482,300	1,500	25
5,672	2,852	2,820	144,300	3,132,143	1,786	3,130,357	.....	26
39,000	36,000	3,000	127,678	425,895	.....	.....	425,895	27
.....	.....	.....	.....	.....	.....	.....	.....	28
192,113	100,447	91,666	380,369	2,679,438	.....	.....	2,679,438	29
42,839	37,539	5,300	136,638	1,427,306	.....	.....	1,427,306	30
1,460	1,460	.....	8,760	5,000	.....	5,000	.....	31
.....	.....	.....	.....	.....	.....	.....	.....	32
66,917	51,360	15,557	338,523	2,681,593	1,531,143	115,300	1,035,150	33

c No reports received in 1890.

TABLE 2.—DETAILED STATEMENT, SALT MANUFACTURE,

	STATES AND TERRITORIES.	CAPITAL.								
		Number of establishments reporting.	Aggregate.	Value of plant.				Live assets.			
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	200	$13,437,749	$11,247,548	$4,287,784	$4,255,896	$2,703,868	$2,190,201	$321,543	$1,010,321	$858,337
2	California	9	362,135	183,125	112,500	29,300	41,325	179,010	25,150	15,500	138,360
3	Kansas	23	781,085	614,118	94,005	435,039	85,074	166,967	12,299	34,472	120,196
4	Michigan	81	3,195,120	2,397,764	379,478	1,251,893	766,393	797,356	168,713	542,903	85,740
5	Nevada	3	23,500	16,500	5,000	5,500	6,000	7,000	2,600	2,000	2,400
6	New York	50	7,171,126	6,599,090	3,327,184	1,808,580	1,463,326	572,036	30,649	278,444	262,943
7	Ohio	9	425,731	348,800	57,000	206,800	105,000	76,931	10,650	9,432	56,849
8	Pennsylvania	3	157,413	97,600	20,000	66,000	11,600	59,813	7,707	11,962	40,144
9	Utah	9	238,136	166,981	105,681	32,950	28,350	71,155	30,525	31,760	8,870
10	West Virginia	5	361,966	331,450	102,416	159,334	69,700	30,516	650	19,948	9,918
11	All other states (a)	8	721,537	492,120	104,520	260,500	127,100	229,417	32,600	63,900	132,917

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

	STATES AND TERRITORIES.	Clerks.						Operatives and skilled.								
		Males above 16 years.			Females above 15 years.			Males above 16 years.			Females above 15 years.			Children.		
		Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.
1	The United States	80	$16.18	$59,554	3	$6.73	$875	1,493	$11.31	$635,643	22	$6.41	$5,085	9	$4.94	$1,262
2	California	5	20.08	5,220	.....	.....	.....	48	13.14	20,810	.....	.....	.....	.....	.....	.....
3	Kansas	14	18.34	12,558	.....	.....	.....	44	13.31	24,127	1	6.92	360	.....	.....	.....
4	Michigan	10	15.88	6,245	1	7.69	200	555	11.74	229,939	19	6.46	4,225	9	4.94	1,262
5	Nevada	.....	.....	.....	.....	.....	.....	5	16.33	2,830	.....	.....	.....	.....	.....	.....
6	New York	19	14.67	14,397	2	6.49	675	531	10.42	197,259	2	5.77	500	.....	.....	.....
7	Ohio	7	13.14	3,700	.....	.....	.....	88	8.35	28,745	.....	.....	.....	.....	.....	.....
8	Pennsylvania	2	22.07	2,200	.....	.....	.....	30	12.21	15,339	.....	.....	.....	.....	.....	.....
9	Utah	2	21.14	733	.....	.....	.....	65	12.59	30,275	.....	.....	.....	.....	.....	.....
10	West Virginia	7	10.15	3,221	.....	.....	.....	50	9.63	22,403	.....	.....	.....	.....	.....	.....
11	All other states	14	17.95	11,280	.....	.....	.....	107	13.57	63,916	.....	.....	.....	.....	.....	.....

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (b)

	STATES AND TERRITORIES.	Males above 16 years.											Females above 15 years.					Children.			
		Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.
1	The United States	3,795	51	15	191	520	681	946	718	383	145	71	74	78	8	33	28	9	35	17	13	5
2	California	167	.....	.....	12	74	1	52	3	2	6	9	8	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	Kansas	344	.....	.....	13	.....	8	40	215	30	27	4	7	16	2	13	1	.....	.....	.....	.....	.....
4	Michigan	1,235	32	2	17	58	202	447	261	118	51	22	25	35	6	9	19	1	26	8	13	5
5	Nevada	22	.....	.....	.....	.....	16	3	.....	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	New York	1,140	18	2	15	177	365	279	136	103	19	6	20	27	.....	11	8	8	9	9	.....	.....
7	Ohio	231	.....	7	26	116	36	21	11	6	4	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	Pennsylvania	59	.....	.....	2	.....	3	14	23	7	3	4	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	Utah	174	.....	.....	96	1	.....	2	16	27	18	11	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	West Virginia	165	1	.....	10	43	21	46	27	13	2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
11	All other states	258	.....	4	.....	51	29	42	26	77	13	11	5	.....	.....	.....	.....	.....	.....	.....	.....	.....

a Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Illinois, 1; Kentucky, 2; Louisiana, 1; Massachusetts, 1; Texas, 2; Virginia, 1.

BY STATES AND TERRITORIES: 1890.

MISCELLANEOUS EXPENSES.								AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS.					
								Aggregates.		Officers or firm members actively engaged in the industry or in supervision.			
										Males above 16 years.			
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of building and machinery.	Amount paid to contractors.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Average number.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	
$674,183	$38,419	$59,532	$56,679	$239,375	$5,704	$36,008	$238,466	4,455	$1,782,491	117	$26.28	$128,020	1
31,433	1,950	1,753	612	5,625	.....	1,738	19,755	173	81,525	8	36.03	11,632	2
39,301	275	3,432	3,486	6,030	.....	3,625	13,453	449	187,660	20	18.70	20,247	3
246,547	12,695	25,784	34,531	106,219	5,704	5,184	56,430	1,629	578,614	24	23.64	21,508	4
230	.....	230	.....	.....	.....	.....	.....	22	7,210	.....	.....	.....	5
228,252	.....	17,253	10,932	81,419	.....	18,672	99,976	1,245	544,326	22	33.38	35,470	6
27,905	.....	3,938	2,312	17,227	.....	1,260	3,168	260	87,079	9	15.94	6,218	7
21,167	4,499	1,180	251	7,500	.....	.....	7,737	59	38,200	5	38.59	9,700	8
13,761	.....	1,065	231	2,220	.....	798	9,447	180	53,858	6	25.11	3,700	9
15,043	.....	2,542	1,364	7,131	.....	1,031	2,975	165	67,548	6	18.88	4,950	10
59,544	19,000	2,355	2,960	6,004	.....	3,700	25,525	273	136,471	11	32.47	15,195	11

AVERAGE NUMBER OF EMPLOYÉS IN EACH CLASS AND AVERAGE WEEKLY EARNINGS—continued.

Unskilled.										Pieceworkers.						Average number of hours in an ordinary day of labor.		
Males above 16 years.			Females above 15 years.			Children.			Summary.		Males above 16 years.		Females above 15 years.		Children.			
Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Average weekly earnings per employé.	Total wages.	Number.	Total wages.	Number.	Total wages.	Number.	Total wages.	Number.	Total wages.	May to November	November to May.	
2,105	$8.80	$761,948	53	$5.22	$13,650	26	$4.60	$4,654	547	$171,200	457	$148,356	73	$20,456	17	$2,388	10.39	10.28	1
106	7.80	42,031	.....	.....	.....	.....	.....	.....	6	1,832	6	1,832	.....	.....	.....	.....	10.33	9.22	2
260	10.05	99,152	15	4.77	3,720	.....	.....	.....	89	27,496	89	27,496	.....	.....	.....	.....	11.39	11.39	3
646	9.13	205,485	15	3.96	2,520	17	4.90	2,920	333	104,310	292	95,322	26	6,678	15	2,310	10.36	10.27	4
17	8.42	4,380	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10.00	10.00	5
598	8.73	262,502	23	6.20	7,410	9	4.17	1,734	69	24,379	22	10,601	47	13,778	.....	.....	10.29	10.27	6
127	7.56	40,383	.....	.....	.....	.....	.....	.....	29	8,033	29	8,033	.....	.....	.....	.....	9.78	9.67	7
22	9.58	10,961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10.00	10.00	8
101	8.94	17,200	.....	.....	.....	.....	.....	.....	6	1,950	4	1,872	.....	.....	2	78	9.67	9.22	9
102	8.36	36,974	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.10	8.90	10
126	8.05	42,880	.....	.....	.....	.....	.....	.....	15	3,200	15	3,209	.....	.....	.....	.....	10.75	10.63	11

COST OF MATERIALS USED.						PRODUCTS.									
	Fuel.					Salt.								All other products.	
						Total.		Rock.		Solar.		Boiling process.			
Aggregate.	Total.	Coal.	Wood.	Other fuel.	All other materials. (Dollars.)	Aggregate value. (Dollars.)	Bushels.	Value. (Dollars.)	Bushels.	Value.	Bushels.	Value.	Bushels.	Value.	Value.	
$1,826,770	$745,917	$589,123	$30,511	$126,283	1,080,853	5,484,618	52,034,300	5,441,303	7,066,405	$510,825	7,216,312	$615,901	37,751,583	$4,314,577	$43,315	1
20,067	2,027	1,227	800	.....	18,040	166,722	1,276,641	166,722	.....	.....	1,276,641	160,722	.....	.....	.....	2
352,574	195,286	195,286	.....	.....	157,288	697,802	5,703,995	697,802	89,286	8,500	20,000	4,000	5,594,709	685,302	.....	3
784,012	138,882	45,484	25,261	68,137	645,130	2,046,975	18,645,553	2,041,375	.....	.....	64,286	7,500	18,581,267	2,033,875	5,600	4
90	90	90	.....	.....	.....	21,491	126,249	21,491	.....	.....	126,249	21,491	.....	.....	.....	5
443,602	252,776	223,309	.....	29,467	190,826	1,563,228	16,131,251	1,563,228	5,444,190	393,325	2,483,479	254,612	8,203,582	915,291	.....	6
83,552	49,513	41,426	.....	8,087	34,039	212,541	2,047,569	204,324	.....	.....	.....	.....	2,047,569	204,324	8,217	7
27,445	15,592	.....	.....	15,592	11,853	156,398	862,000	136,800	.....	.....	.....	.....	862,000	136,800	19,598	8
5,072	2,852	2,602	250	.....	2,820	144,300	3,132,143	144,300	1,786	1,000	3,130,357	143,300	.....	.....	.....	9
42,839	37,539	32,539	.....	5,000	5,300	136,638	1,427,306	126,738	.....	.....	.....	.....	1,427,306	126,738	9,900	10
66,917	51,360	47,160	4,200	.....	15,557	338,523	2,681,593	338,523	1,531,143	108,060	115,300	18,276	1,035,150	212,247	.....	11

b In comparing the weekly rates of wages and the number of employés at each rate with the average weekly earnings, it must be remembered that it is not practicable to obtain true average weekly earnings from the table of weekly rates, because the term of employment varies for employés at the respective rates.

FOREST INDUSTRIES.

FOREST INDUSTRIES.

BY GEORGE A. PRIEST.

This report is for the census year ending May 31, 1890, and presents statistics for the following branches of the forest industries: (1) lumber mills and saw mills; (2) timber products not manufactured by milling establishments; (3) tar and turpentine.

For convenience of collection, and to enable their lucid and comprehensive presentation, the data for these statistics were obtained on several schedules of inquiry, uniform as to general heads of investigation, but differing in technical questions, which were formulated with special reference to the conditions peculiar to each of the several branches of productive industry using crude forest products for their raw material. In order to show concisely the full extent of the industry, the data relating to the operations of all these branches are consolidated and presented in the following statement, which shows the totals for the United States, for each state and territory, and for industrial groups of states and territories. Statistics in detail for each branch will be found under their proper head in the pages following.

FOREST INDUSTRIES, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.		Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)		ANIMALS IN USE.		Cost of materials used.	VALUE OF PRODUCTS.		
		Value of hired property.	Direct investment.		Employés.	Wages	Average number.	Cost of keep.		Total.	Manufactured at mill.	Not manufactured at mill.
United States.	23,287	$10,594,025	$561,943,429	$241,023,299	521,806	$141,063,326	106,942	$7,959,849	$199,064,772	$446,034,761	$389,303,417	$56,731,344
Eastern group	6,783	3,159,722	103,085,296	3,917,224	111,225	27,303,135	17,278	1,298,780	31,654,813	79,158,889	73,243,308	5,915,581
Maine	894	468,846	12,978,315	570,210	20,301	3,897,715	2,920	164,126	5,161,619	11,849,654	10,760,876	1,088,778
New Hampshire	570	231,060	7,592,167	260,207	9,127	2,250,714	2,763	185,011	1,961,524	5,641,445	4,983,412	658,033
Vermont	779	97,085	7,789,874	286,626	10,745	2,395,879	2,771	168,773	3,037,406	6,958,674	6,810,797	147,877
Massachusetts	488	247,950	5,135,860	315,111	4,450	1,633,631	782	71,927	2,248,851	5,211,607	4,976,983	234,624
Rhode Island	32	22,250	135,156	9,912	262	92,088	48	4,558	89,916	264,625	212,050	52,575
Connecticut	176	47,780	1,092,586	40,852	1,292	435,745	423	42,564	610,763	1,353,544	1,113,609	239,935
New York	1,734	933,260	21,430,739	1,011,693	21,687	5,325,849	2,757	201,626	7,315,346	17,160,547	16,191,762	968,785
Pennsylvania	1,948	995,520	45,107,300	1,366,425	41,868	10,872,733	4,576	442,808	10,410,714	29,087,970	26,641,683	2,446,287
New Jersey	114	91,775	1,557,508	48,233	709	268,645	84	8,029	655,186	1,225,766	1,172,799	52,967
Delaware	48	24,196	265,791	7,955	694	130,136	154	9,358	163,488	405,057	379,337	25,720
Lake group	3,635	2,397,433	274,101,518	11,981,603	190,518	48,315,593	33,461	2,691,835	84,904,448	169,163,545	137,539,529	31,624,016
Michigan	2,124	927,453	129,467,072	5,521,688	91,319	25,111,583	11,671	1,237,193	40,695,684	83,121,969	68,119,944	15,002,025
Wisconsin	1,119	1,075,905	105,191,521	4,701,509	73,484	17,037,744	15,492	1,089,749	30,765,964	60,966,444	49,754,382	11,212,062
Minnesota	392	394,075	39,442,925	1,758,406	25,715	6,166,266	6,298	364,893	13,442,800	25,075,132	19,665,203	5,409,929
Central group	6,161	2,836,317	54,456,431	2,881,228	73,348	20,532,118	10,239	612,214	34,195,662	71,561,841	68,855,788	2,706,053
Ohio	1,461	985,675	11,806,709	628,390	14,611	4,157,028	1,318	93,322	7,146,330	15,279,843	14,983,679	296,164
Indiana	1,633	604,348	11,387,470	620,334	18,918	5,742,464	1,765	127,634	9,708,700	20,278,023	19,776,776	501,247
Illinois	363	267,015	4,095,212	359,358	5,360	1,358,002	557	30,718	2,679,379	5,135,155	5,064,975	70,180
West Virginia	454	15,800	5,086,114	173,073	6,641	1,712,938	1,466	108,465	2,485,645	5,515,065	5,174,471	340,594
Kentucky	599	372,734	6,571,374	380,897	8,257	2,245,886	688	33,907	3,912,769	7,904,428	7,544,032	360,396
Tennessee	820	262,950	7,259,027	344,654	9,891	2,551,940	1,877	101,735	4,641,893	9,073,686	8,880,109	193,577
Missouri	831	327,795	8,250,525	374,522	9,670	2,763,860	2,568	116,433	3,620,946	8,375,641	7,431,746	943,895

a Includes officers, firm members, and clerks, and their wages; also the 42,025 employés shown in Table 2, reported as the estimated number employed by contractors, and their wages.

FOREST INDUSTRIES, BY STATES AND TERRITORIES: 1890—Continued.

STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.		Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		ANIMALS IN USE.		Cost of materials used.	VALUE OF PRODUCTS.		
		Value of hired property.	Direct investment.		Employés.	Wages.	Average number.	Cost of keep.		Total.	Manufactured at mill.	Not manufactured at mill.
Southern group	5,096	$1,391,237	$63,405,240	$2,687,603	104,283	$27,544,343	34,377	$2,350,375	$28,150,305	$76,307,471	$65,048,445	$11,259,026
Maryland	217	119,370	1,459,895	54,577	2,233	493,266	475	27,636	712,738	1,600,472	1,552,438	48,034
Virginia	663	185,200	4,427,627	231,276	9,521	1,983,665	2,196	155,453	2,196,720	5,630,600	5,501,327	129,273
North Carolina	907	104,422	6,161,862	238,403	11,992	2,316,948	2,788	194,719	3,218,984	7,604,575	5,609,493	1,995,082
South Carolina	553	85,725	2,454,028	103,313	6,692	1,151,601	2,347	180,107	1,229,952	3,670,850	1,939,124	1,731,726
Georgia	677	98,725	7,262,227	312,582	19,772	4,628,136	6,030	496,404	2,904,776	10,787,450	6,216,585	4,570,865
Florida	230	130,510	5,621,358	271,464	6,700	2,092,428	1,740	140,569	2,106,139	5,706,738	5,294,194	412,544
Alabama	479	156,670	7,527,173	299,277	11,389	3,177,966	4,717	303,205	3,143,402	8,623,521	8,021,594	601,927
Mississippi	390	199,750	4,672,486	219,776	8,642	2,303,718	3,446	201,736	1,922,586	6,052,453	5,636,170	416,283
Louisiana	127	71,130	5,714,313	216,757	4,495	1,680,969	794	51,439	2,699,295	5,745,194	5,496,393	248,801
Arkansas	539	147,720	6,928,720	283,221	10,784	3,203,125	5,336	308,278	3,421,530	8,943,052	8,556,769	386,283
Texas	314	92,015	11,175,551	456,957	12,063	4,512,521	4,508	290,829	4,594,183	11,942,566	11,224,358	718,208
Pacific group	1,070	499,050	45,687,542	1,731,558	29,437	12,950,305	9,424	830,740	11,538,615	32,775,713	28,531,131	4,244,582
California	258	68,100	16,184,235	553,805	9,584	4,022,621	3,580	290,836	2,290,293	8,794,655	7,906,732	885,923
Oregon	350	146,300	8,103,000	354,278	7,214	2,716,968	2,522	171,090	2,104,631	6,530,757	5,706,345	824,412
Washington	462	284,650	21,400,307	823,475	12,639	6,210,716	3,322	368,814	7,143,691	17,450,301	14,916,054	2,534,247
Miscellaneous group.	542	310,266	21,207,402	824,083	12,995	4,417,832	2,163	175,905	9,520,929	17,067,302	16,085,216	982,086
Alaska	10	21,350	105,727	5,252	91	22,735	.....	.....	29,636	58,440	58,390	50
Arizona	4	.....	212,975	10,485	164	104,600	160	18,920	61,395	248,790	155,790	93,000
Colorado	120	31,781	941,561	51,132	1,655	608,143	753	77,886	403,962	1,363,749	1,148,330	215,419
Idaho	44	9,250	462,130	17,873	456	159,560	160	14,640	225,097	631,790	423,940	207,850
Indian territory	3	.....	16,000	1,000	51	18,100	14	1,400	17,200	41,950	41,950	.....
Iowa	143	165,760	17,530,335	638,090	7,408	2,413,890	36	2,810	7,894,448	12,056,302	11,669,437	386,865
Kansas	27	5,075	70,865	4,109	155	23,264	10	452	35,761	85,521	74,196	11,325
Montana	31	.....	832,948	41,845	1,158	470,755	213	26,157	379,710	1,182,510	1,174,080	8,430
Nebraska	31	34,400	96,539	6,714	206	55,864	38	1,020	56,865	154,945	149,448	5,497
New Mexico	26	6,750	193,335	13,812	442	211,041	411	14,080	109,181	389,761	378,561	11,200
North Dakota	5	.....	118,830	3,745	138	25,810	.....	.....	36,045	76,173	76,173	.....
Oklahoma	8	8,400	16,605	2,075	35	6,570	.....	.....	13,900	27,260	27,260	.....
South Dakota	41	7,100	251,255	12,707	548	157,115	233	11,206	110,696	375,709	350,709	25,000
Utah	32	12,900	198,248	8,542	370	96,067	131	7,184	97,257	249,940	232,490	17,450
Wyoming	17	7,500	160,049	6,702	118	44,318	4	150	49,776	124,462	124,462	.....

The statistics under the title "Lumber mills and saw mills" comprise all data relating to operations conducted by mills, while those under the title "Timber products not manufactured by milling establishments" comprise all other forest industries that are considered as mechanical or manufacturing except "Tar and turpentine", which is shown separately. Some of the industries assigned to the classification of "Timber products not manufactured by milling establishments", such as split shingles and charcoal, were reported under distinct heads at the census of 1880, but dissimilarity in the form and scope of the inquiry renders comparison of such industries impracticable.

The foregoing figures do not include the manufacture of cellulose or wood pulp, because a large part of the data relating to its production is included in the statistics relating to the manufacture of paper, and it was impracticable to make a separation.

As nearly as can be ascertained, however, the consumption of wood in the manufacture of wood pulp during the census year was about 96,640,000 cubic feet, the varieties used consisting principally of spruce, poplar, cottonwood, and balsam.

LUMBER MILLS AND SAW MILLS.

The object of the inquiry at the Eleventh Census regarding lumber mills and saw mills was to procure from manufacturers such information as would enable a statement to be made in the reports which would exhibit accurately the conditions of the industry as conducted in its various branches, showing these conditions by totals for the different states and territories.

For the purpose of this report the term "lumber mills" means only those mills in which sawed lumber forms the principal product, while the term "saw mills" means all other mills in which logs or bolts form the principal raw material, and are manufactured into any kind of product other than lumber excepting cellulose or wood pulp, the statistics for which are presented in the general report on manufactures.

Table 1, accompanying this report, is a comparative statement for the census years 1870, 1880, and 1890, showing by states and territories the number of establishments, capital, average number of employés at the mill, and their wages, cost at mill of materials used, and value at mill of manufactured products.

In comparing the statistics for 1890 with those of previous censuses it must be remembered that there have been numerous changes in both the form and the scope of the inquiry used at the Eleventh Census as compared with the inquiries adopted at the censuses of 1870 and 1880. Only such items of the returns for 1890 are shown as correspond with preceding census reports.

The following summary presents the leading statistics for the lumber mills and saw mills, by totals, for the United States, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, LUMBER MILLS AND SAW MILLS: 1870, 1880, AND 1890.

ITEMS.	1870 (a)	1880	1890
Number of establishments reporting	25,832	25,708	21,011
Capital (b)	$143,493,232	$181,186,122	$496,339,968
Miscellaneous expenses	(c)	(c)	$20,136,273
Average number of employés (aggregate)	149,997	147,956	d286,197
Total wages	$40,009,162	$31,845,974	d$87,784,433
Officers, firm members, and clerks:			
Average number	(e)	(e)	19,468
Total wages	(e)	(e)	$10,689,198
All other employés:			
Average number	(e)	(e)	266,729
Total wages	(e)	(e)	$77,095,235
Cost of materials used	$103,343,430	$146,155,385	f$231,555,618
Value of products	$210,159,327	$233,268,729	$403,667,575

a See remarks in regard to the depreciated currency of 1870, given in text below.
b Value of hired property is not included in the capital reported in 1890, because it was not included in the reports of previous census years.
c Not reported.
d Only includes employés and wages at mill.
e Not reported separately.
f For purposes of comparison, includes wages reported under the heads of "Logging" and "Cost of keep of animals", shown in Table 2.

A marked decrease appears in the number of establishments reported for 1890. In strong contrast to this decrease is the great increase in the average value of product per establishment, which indicates the concentration of the industry and its increased productive capacity. This is shown by the following statement of the averages per establishment for 1870, 1880, and 1890:

AVERAGE CAPITAL, NUMBER OF EMPLOYÉS, WAGES, MATERIALS, AND PRODUCTS PER ESTABLISHMENT, LUMBER MILLS AND SAW MILLS: 1870, 1880, AND 1890.

YEARS.	Capital. (a)	Number of employés.	Wages.	Cost of materials used.	Value of products.
1870	$5,554.86	5.81	$1,548.82	$4,000.60	$8,135.62
1880	7,047.85	5.76	1,238.76	5,685.21	9,073.78
1890	23,622.86	b13.62	b4,178.02	11,020.69	19,212.20

a Value of hired property is not included in the capital reported in 1890, because it was not included in the reports of previous census years.
b Only includes employés and wages at mill.

The wide diffusion of petty establishments 50 years ago is shown by the fact that 31,650 lumber mills were reported at the census of 1840, while the total value of their product was only $12,943,507, less than that now produced annually in the state of Washington.

In all comparisons with values reported for 1870 it should be remembered that the values for that census were expressed in a currency which was at a discount in gold. The average premium on gold during the 12 months (June 1, 1869, to May 31, 1870) which constituted the census year was about one-fourth (25.3 per cent). A premium on gold of one-fourth is equivalent to a discount on currency of one-fifth. For purposes of comparison therefore the values of 1870 should be reduced in that ratio.

The statistics for 1890 comprise data compiled from the reports of 18,064 lumber manufacturing establishments, 438 establishments engaged exclusively in the manufacture of staves and heading, 702 establishments engaged exclusively in the manufacture of shingles, and 1,807 establishments manufacturing miscellaneous products. The following statement shows the distribution of these establishments in the various states and territories:

LUMBER MILLS AND SAW MILLS, CLASSIFIED ACCORDING TO PRODUCT, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	NUMBER OF ESTABLISHMENTS ENGAGED IN THE MANUFACTURE OF—				
	Total.	Lumber.	Staves and heading exclusively.	Shingles exclusively.	Miscellaneous products.
The United States	21,011	18,064	438	702	1,807
Eastern group	6,422	5,231	101	210	880
Maine	831	611	53	32	135
New Hampshire	531	388	7	22	114
Vermont	736	569	5	19	143
Massachusetts	464	363	6	4	91
Rhode Island	29	22	.....	3	4
Connecticut	157	121	.....	.....	36
New York	1,664	1,378	12	60	214
Pennsylvania	1,853	1,662	17	69	105
New Jersey	110	77	.....	1	32
Delaware	47	40	1	.....	6
Lake group	3,088	2,613	96	212	167
Michigan	1,918	1,574	74	172	98
Wisconsin	853	755	22	29	47
Minnesota	317	284	.....	11	22
Central group	5,945	5,127	203	73	542
Ohio	1,427	1,164	55	7	201
Indiana	1,603	1,324	72	36	171
Illinois	357	319	9	1	28
West Virginia	428	402	7	.....	19
Kentucky	595	505	15	19	56
Tennessee	787	703	37	9	38
Missouri	748	710	8	1	29
Southern group	4,206	3,896	37	118	155
Maryland	212	197	.....	1	14
Virginia	638	587	10	4	37
Southern group—Continued.					
North Carolina	688	644	.....	14	30
South Carolina	328	315	1	1	11
Georgia	434	406	1	17	10
Florida	202	177	.....	6	19
Alabama	437	411	2	13	11
Mississippi	338	324	4	1	9
Louisiana	122	108	1	8	5
Arkansas	523	468	18	29	8
Texas	284	259	.....	24	1
Pacific group	831	717	1	83	30
California	221	180	.....	20	21
Oregon	300	279	1	16	4
Washington	310	258	.....	47	5
Miscellaneous group	519	480	.....	6	33
Alaska	10	10	.....	.....	.....
Arizona	4	4	.....	.....	.....
Colorado	109	109	.....	.....	.....
Idaho	41	37	.....	3	1
Indian territory	3	3	.....	.....	.....
Iowa	137	109	.....	.....	28
Kansas	27	24	.....	.....	3
Montana	30	30	.....	.....	.....
Nebraska	31	30	.....	.....	1
New Mexico	26	24	.....	2	.....
North Dakota	5	5	.....	.....	.....
Oklahoma	8	8	.....	.....	.....
South Dakota	41	41	.....	.....	.....
Utah	30	30	.....	.....	.....
Wyoming	17	16	.....	1	.....

This report includes only such planing mills as are operated by lumber manufacturers in connection with lumber mills. The statistics relating to all other planing mills, sash, door, and blind factories, box factories, turning works, and similar woodworking industries engaged in the remanufacture of lumber and saw mill products will be found under their proper titles in the general statistics on manufactures. The data relating to such industries when allied to lumber and saw mill operations are stated separately under the principal heads of the tabular presentation for 1890.

The form of the inquiry concerning the industries covered by this report corresponded, in its general plan, with that adopted for the collection of all statistics of manufactures, but in order to secure a complete statistical presentation for each of the varied branches which it embraced an arrangement of questions was required under each of its general heads which would include the entire series of operations by any establishment, from the cutting of the tree in the forest to the output at the mill of the finished product. From the individual reports made upon the form adopted the information contained in the following tables has been compiled. It should be understood, however, that the tables do not disclose the profits of manufacturing, because the scope of the inquiry does not embrace data essential to such a disclosure; the value of the product reported is its value "at the mill", not including expenses of or allowance for selling and mercantile risks. The cost of depreciation of plant in excess of the expense for ordinary repairs is also omitted.

CAPITAL.

The disproportion in the ratio of capital employed to value of manufactured products for 1890 as compared with 1880 is probably due to the radical change in the form of the inquiry used at the Eleventh Census respecting capital. This change, it is believed, has resulted in a more complete exhibit of the capital employed in all branches of the industry at the census of 1890 than that made at preceding censuses.

The form of question used at the census of 1880 was as follows: "Capital (real and personal) invested in the business". This form of inquiry, when addressed to an establishment owning timbered land tributary to mill or engaged in cutting standing timber, was not sufficiently comprehensive. In some cases the entire capital employed was reported, while in others only the capital directly invested in mill operations was stated.

The form of inquiry used at the census of 1890 required a distinct statement of capital employed in the production of logs and all other forest products, in the manufacture of logs into lumber and other mill products, and also in the remanufacture of such mill products into any other form of product. The subdivisions of the inquiry respecting capital were calculated to develop the full amount of capital owned, borrowed, and hired, and the results of the inquiry will be found detailed in Table 2.

The average apportionment to the principal heads of the inquiry of each $100 of capital employed in the lumber mills and saw mills in the respective states is shown in the following statement:

AVERAGE APPORTIONMENT OF PRINCIPAL CLASSES OF INVESTMENT IN EACH $100 OF CAPITAL, LUMBER MILLS AND SAW MILLS, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	CLASSES OF INVESTMENT.			
	Timbered land (tributary to mill).	Logging.	Mill plant.	Live assets.
The United States	26.01	12.18	27.10	34.71
Eastern group	24.21	10.50	30.59	34.70
Maine	14.13	12.76	35.82	37.29
New Hampshire	19.42	7.66	38.04	34.88
Vermont	18.91	9.91	34.70	36.48
Massachusetts	6.40	6.64	42.84	44.12
Rhode Island	8.85	5.06	60.94	25.15
Connecticut	9.11	5.84	49.79	35.26
New York	16.77	11.13	38.76	33.34
Pennsylvania	35.24	10.91	20.77	33.08
New Jersey	6.66	3.18	49.17	40.99
Delaware	14.80	11.41	52.48	21.31
Lake group	32.46	13.63	19.21	34.70
Michigan	32.06	13.34	19.87	34.73
Wisconsin	36.93	13.21	16.52	33.34
Minnesota	20.69	16.06	24.61	38.64
Central group	9.76	7.65	39.14	43.45
Ohio	10.92	8.42	43.18	37.48
Indiana	6.86	6.16	39.35	47.63
Illinois	5.83	6.56	31.54	56.07
West Virginia	18.76	11.89	28.84	40.51
Kentucky	5.63	6.53	38.73	49.11
Tennessee	7.72	5.60	38.94	47.74
Missouri	14.46	9.59	43.29	32.66
Southern group	20.48	14.09	38.82	26.61
Maryland	14.41	9.78	43.84	31.97
Virginia	14.83	11.23	47.62	26.32
North Carolina	21.22	9.84	46.05	22.89
South Carolina	22.04	19.30	44.09	14.57
Georgia	21.64	21.92	37.22	19.22
Florida	21.44	13.08	41.42	24.06
Alabama	20.10	20.45	38.62	20.83
Mississippi	16.81	13.51	41.87	27.81
Louisiana	12.51	11.97	37.40	38.12
Arkansas	23.03	11.52	37.15	28.30
Texas	26.29	12.71	30.20	30.80
Pacific group	27.13	13.02	32.49	27.36
California	38.16	23.21	18.93	19.70
Oregon	23.13	12.29	38.45	26.13
Washington	19.69	5.02	41.23	34.06
Miscellaneous group	19.73	8.95	21.27	50.05
Alaska	.....	2.08	89.39	8.53
Arizona	.....	46.95	37.66	15.39
Colorado	9.27	19.12	33.18	38.43
Idaho	3.00	16.01	45.35	35.64
Indian territory	.....	2.50	37.50	60.00
Iowa	22.82	7.99	17.63	51.56
Kansas	5.94	10.07	59.66	23.43
Montana	2.14	7.35	24.09	66.42
Nebraska	4.35	2.32	53.76	39.57
New Mexico	2.53	16.09	56.19	25.19
North Dakota	6.83	.....	49.06	44.11
Oklahoma	.....	.....	68.53	31.47
South Dakota	8.92	11.40	41.40	38.28
Utah	1.07	10.16	39.85	48.92
Wyoming	1.31	1.22	51.16	46.31

MISCELLANEOUS EXPENSES.

No previous census inquiry has embraced the cost incurred in manufacturing operations other than that of wages and materials. The inquiry at the Eleventh Census was designed to embrace the entire cost of production other than allowance for depreciation of plant. The inquiry was intended to ascertain the true relations which capital, miscellaneous expenses, wages, and cost of materials bear to the value of product at place of manufacture.

The items of "rent" and "interest" represent the cost to the manufacturer of that portion of capital which is hired or borrowed.

EMPLOYÉS AND WAGES.

In the preceding census reports respecting the lumber and saw mill industry the statistics of employés and wages have been confined to a statement of the average number of males above 16 years, females above 15 years, and children, respectively, employed at the mills and the total amount paid in wages to all during the year.

The form of questions used at the Eleventh Census required employés and wages to be reported under the following classes: (1) officers or firm members actively engaged in the industry or in supervision, their wages being reported at actual rates paid or at the rate which would be paid to an employé performing similar services; (2) clerks; (3) operatives, engineers, and other skilled workmen, and overseers and foremen or superintendents (not general superintendents or managers); (4) watchmen, laborers, teamsters, and other unskilled workmen; (5) pieceworkers.

Reports were obtained of the average number of males above 16 years, females above 15 years, and children employed by mill establishments in each class during the year, and the total wages paid to each number as employed in the various branches of operation from the stump to the finished product. A statement was also obtained showing the various rates per month and the average number of males above 16 years, females above 15 years, and children, respectively, employed at each rate.

The wage statistics compiled from these reports are stated in detail in Tables 3 and 4.

The number of the employés and their wages reported for the year 1890 in Table 1 will not correspond with the total number reported in the tables following, because it is necessary, in order to permit fair comparison with preceding censuses, to show for 1890 only those employés engaged at the mill. In 1890 the employés and wages in each of the different branches of the industry from the standing timber to the finished product were obtained.

MATERIALS USED.

In explanation of the amount shown for 1890 in Table 1 as the cost of materials used by "Lumber mills and saw mills", an exhibit of the items which constitute this amount for each group of states is given in the following statement. This statement also shows the total cost of all forest products and the cost at the mill of all logs and bolts used during the year.

COST OF MATERIALS USED, LUMBER MILLS AND SAW MILLS, BY INDUSTRIAL GROUPS OF STATES AND TERRITORIES: 1890.

ITEMS.	United States.	Eastern group.	Lake group.	Central group.	Southern group.	Pacific group.	Miscellaneous group.
Value of stumpage	$34,417,861	$5,492,271	$22,154,336	$2,636,126	$2,763,762	$1,132,988	$238,378
Cost of logging supplies	2,101,595	324,275	1,029,576	68,128	349,235	293,201	37,180
Wages paid in woods	22,920,082	4,309,015	8,991,106	2,145,626	4,536,489	2,527,989	409,857
Contract labor in woods	9,647,464	2,826,941	3,874,695	431,943	1,840,338	601,174	72,373
Keep of animals	6,112,170	1,120,020	1,962,036	534,697	1,811,828	532,454	151,135
Wages expended in transportation of logs to mill	6,424,246	1,815,815	1,505,796	628,345	1,740,751	613,810	119,731
Total cost of forest products	81,623,420	15,888,337	39,517,545	6,444,865	13,042,403	5,701,616	1,028,654
Deduct value of forest products which have not become material of the mill.	14,364,158	1,959,459	9,073,526	899,436	1,104,122	985,375	342,240
Cost at mill of logs and bolts cut by milling establishments and used as material at the mill.	67,259,262	13,928,878	30,444,019	5,545,429	11,938,281	4,716,241	686,414
Add cost of logs and bolts purchased	96,906,167	18,274,826	28,423,135	24,242,035	13,139,256	6,703,921	6,122,944
Total cost of logs and bolts delivered at mill	164,165,429	32,203,704	58,867,154	29,787,514	25,077,537	11,420,162	6,809,358
Add cost of mill supplies and all other materials of mill, other than planing mill.	12,425,215	1,376,218	a7,296,091	1,436,850	1,318,164	690,844	307,048
Total cost of materials for mill products other than planing mill.	176,590,644	33,579,922	66,163,245	31,224,364	26,395,701	12,111,006	7,116,406
Add cost of materials for planing mills (lumber, mill supplies, and all other materials).	40,600,816	5,239,392	17,252,094	5,502,441	7,737,196	2,169,309	2,700,384
Total cost of materials entering into saw, lumber, and planing mill products.	217,191,460	38,819,314	83,415,339	36,726,805	34,132,897	14,280,315	9,816,790
Add value of forest products, previously deducted	14,364,158	1,959,459	9,073,526	899,436	1,104,122	985,375	342,240
Aggregate cost of materials used by the lumber mill and saw mill industry. (See Table 1.)	231,555,618	40,778,773	92,488,865	37,626,241	35,237,019	15,265,690	10,159,030

a Includes all other expenses of transportation.

Labor enters very largely into the manufacture of forest products which become materials for the mill. In order to obtain the ratio which labor and material each bear to the total value of products of the lumber and saw mill industry, it is necessary to start at the stump and separate the cost of each in all stages of the process of converting standing timber into the mill product. The data presented in the following statement show by groups of states the division of cost for labor, materials, and other items of expense in the lumber and saw mill industry, estimated upon the base that the raw material of each establishment was standing timber. In this statement the cost of "logs and bolts purchased" has been distributed among the several items constituting the "Total cost of forest products" shown in the preceding statement. This distribution has been made in the ratio that each item bears to the total.

ESTIMATED PROPORTION OF THE PRINCIPAL ITEMS OF COST TO TOTAL COST OF MANUFACTURE, THE RAW MATERIAL OF EACH ESTABLISHMENT BEING STANDING TIMBER, LUMBER MILLS AND SAW MILLS, BY INDUSTRIAL GROUPS OF STATES AND TERRITORIES: 1890.

ITEMS IN COST OF MANUFACTURE.	United States.	Eastern group.	Lake group.	Central group.	Southern group.	Pacific group.	Miscellaneous group.
Total	$100.00	$100.00	$100.00	$100.00	$100.00	$100.00	$100.00
Value of stumpage	25.13	21.08	33.96	24.39	12.16	10.95	14.06
Logging supplies	1.53	1.24	1.58	0.63	1.54	2.83	2.20
Keep of animals	4.47	4.30	3.00	4.95	7.97	5.15	8.92
Mill supplies and all other materials	4.38	2.67	6.69	3.03	3.23	3.36	2.82
Miscellaneous expenses	6.72	6.73	7.68	5.53	5.39	7.26	6.91
Wages	57.77	63.98	47.09	61.47	69.71	70.45	65.09

From the foregoing statement it appears that labor constitutes 57.77 per cent and all other items of cost 42.23 per cent of the aggregate cost of the products of this industry in the United States.

PRODUCTS.

The classification of mill products adopted for the schedule of inquiry used at the Eleventh Census was enlarged to ascertain the quantities of special lumber products required in certain industries as raw material. The added classes consist of agricultural implement stock, carriage and wagon stock, furniture stock, and pickets. A specific statement for each class of lumber product is made in Table 2. An exhibit of the items constituting the value of "All other products" for the respective groups of states is given in the statement on the following page.

PRODUCTS INCLUDED UNDER THE HEAD OF "ALL OTHER PRODUCTS" IN TABLE 2, LUMBER MILLS AND SAW MILLS, BY INDUSTRIAL GROUPS OF STATES AND TERRITORIES: 1890.

CLASSES OF PRODUCTS.	United States.	Eastern group.	Lake group.	Central group.	Southern group.	Pacific group.	Miscellaneous group.
Total	**$20,980,752**	**$6,278,673**	**$3,557,295**	**$7,826,428**	**$2,315,733**	**$574,777**	**$427,846**
Agricultural implements	125,000	11,800	.....	97,200	16,000	.....	.....
Ax helves and ox yokes	30,000	3,000	3,000	.....	.....	.....	24,000
Baskets, butter dishes, and fruit crates	2,000,000	612,000	130,000	650,000	533,877	24,123	50,000
Beehives	7,000	4,500	2,500	.....	.....	.....	.....
Boat stock and boat oars	100,000	2,000	1,000	95,000	2,000	.....	.....
Carriage and wagon stock, in shape:							
Hubs and hub stock	775,000	159,000	210,000	366,000	40,000	.....	.....
Spokes	1,550,000	125,000	186,000	1,005,000	234,000	.....	.....
All other wheel stock, panels, and poles	1,400,000	56,873	43,127	950,000	300,000	.....	50,000
Car stock, in shape	130,000	10,000	90,000	30,000	.....	.....	.....
Chairs and chair stock, in shape	610,846	260,000	30,000	177,000	83,000	.....	60,846
Clapboards	350,000	350,000	.....	.....	.....	.....	.....
Cloth boards	15,000	15,000	.....	.....	.....	.....	.....
Clothespins	150,000	135,000	15,000	.....	.....	.....	.....
Clothes racks	4,000	.....	.....	4,000	.....	.....	.....
Cooperage:							
Barrels, casks, tierces, and hogsheads	314,000	82,000	34,000	155,000	16,000	6,000	21,000
Butter tubs	261,000	260,000	.....	.....	.....	.....	1,000
Cheese boxes	150,000	130,000	10,000	10,000	.....	.....	.....
Hoops	1,000,000	45,000	364,000	550,000	34,000	5,000	2,000
Tubs and pails	1,250,000	525,000	175,000	275,000	275,000	.....	.....
Cooperage and cooperage stock, not elsewhere specified	945,752	178,000	85,752	587,000	95,000	.....	.....
Excelsior fiber	500,000	226,000	125,000	119,000	.....	15,000	15,000
Ladders	100,000	60,000	15,000	10,000	5,000	5,000	5,000
Match cards and splints	100,000	50,000	50,000	.....	.....	.....	.....
Measures	6,000	6,000	.....	.....	.....	.....	.....
Mine props	150,000	50,000	10,000	.....	.....	.....	90,000
Novelties, toys, and fancy goods	250,000	200,000	.....	50,000	.....	.....	.....
Paving materials	300,000	.....	150,000	.....	150,000	.....	.....
Pencil stock	150,000	.....	.....	.....	150,000	.....	.....
Sawdust sold	10,000	1,000	8,000	.....	1,000	.....	.....
Sounding boards	100,000	100,000	.....	.....	.....	.....	.....
Scaleboards	10,000	.....	.....	10,000	.....	.....	.....
Shakes	413,654	.....	.....	.....	.....	413,654	.....
Shipbuilding material, in shape	10,000	10,000	.....	.....	.....	.....	.....
Shooks	150,000	100,000	.....	.....	.....	50,000	.....
Telegraph arms and insulator pegs	50,000	30,000	.....	.....	20,000	.....	.....
Toothpicks and cigar lighters	150,000	135,000	15,000	.....	.....	.....	.....
Trunk slats	50,000	1,000	8,000	41,000	.....	.....	.....
Turned and shaped goods, not elsewhere specified:							
Brush and die blocks	55,000	50,000	.....	5,000	.....	.....	.....
Butchers' blocks	10,000	.....	.....	10,000	.....	.....	.....
Cutting blocks	10,000	10,000	.....	.....	.....	.....	.....
Dowel pins, umbrella sticks, and spindles	175,000	155,000	10,000	10,000	.....	.....	.....
Handles	2,500,000	406,000	346,000	1,636,000	102,000	6,000	4,000
Last blocks and lasts	150,000	50,000	.....	100,000	.....	.....	.....
Plane stocks	2,500	2,500	.....	.....	.....	.....	.....
Pumps and water piping	400,000	152,000	20,000	78,000	50,000	.....	100,000
Raft pins	10,000	.....	10,000	.....	.....	.....	.....
Rolls	25,000	12,000	6,000	5,000	2,000	.....	.....
Saddletrees	10,000	.....	.....	10,000	.....	.....	.....
Sap sprouts	1,000	1,000	.....	.....	.....	.....	.....
Shoes, wooden	15,000	.....	15,000	.....	.....	.....	.....
Shoe pegs and treenails	150,000	150,000	.....	.....	.....	.....	.....
Skewers	100,000	.....	.....	100,000	.....	.....	.....
Spools and bobbins	500,000	350,000	15,000	125,000	10,000	.....	.....
Stirrups, wooden	25,000	.....	.....	25,000	.....	.....	.....
Miscellaneous turned and shaped goods, not elsewhere specified	150,000	50,000	40,000	60,000	.....	.....	.....
Veneers from domestic woods	1,500,000	900,000	220,000	155,144	174,856	50,000	.....
Washing machines	15,000	.....	.....	15,000	.....	.....	.....
Whip and harness stock	15,000	.....	.....	15,000	.....	.....	.....
Windmill material	5,000	.....	.....	.....	.....	.....	5,000
Wooden ware not specified	1,490,000	57,000	1,114,916	296,084	22,000	.....	.....

Particular attention is directed to the item in Table 2, "Tolls received for custom sawing", amounting to $9,589,580. This amount represents only earnings for the use of plant and cost of labor. It does not include cost of material, except the comparatively small item of mill supplies, because it is "custom work" usually performed for owners of raw material who are not manufacturers and have not made census returns as such. Therefore no official data are furnished for a statement of the cost of such material or value of its product. Assuming $3 per 1,000 feet arbitrarily to be the average toll for custom sawing, this toll used as a divisor, with the total amount of toll as a dividend, produced 3,196,527 thousand feet as the aggregate quantity of product represented by "custom sawing", which quantity apportioned among the respective states, according to the receipts of toll reported and reckoned at the average value of mill product per 1,000 feet, will considerably increase the total value of sawed lumber in these states.

TIMBER PRODUCTS NOT MANUFACTURED BY MILLING ESTABLISHMENTS.

Timber products not manufactured by milling establishments were reported on a separate schedule, "Special schedule No. 5*a*, timber products". The compilation of data received on this schedule is presented in Tables 5, 6, and 7, but the statistics do not fully represent the extent and value of the industry which the inquiry was intended to embrace. The instructions respecting this inquiry issued to enumerators and special agents directed that it should be presented to all operators engaged in productive industry in forest growth which does not come within the scope of the schedule for agriculture and whose operations are not connected with lumber or saw mills.

The returns for establishments that had offices in cities were secured by the special agents appointed to collect statistics of manufactures; all other establishments were reported by the general enumerators while engaged in enumerating the population.

Upon completing the canvass it was found that no reports whatever were obtained from some districts having an extensive forest area, it having been impracticable to examine and verify the returns obtained by enumerators during the brief period they were at work, and equally so to obtain additional returns by means of correspondence after the conclusion of the canvass.

Had the instructions been strictly followed, the data obtained would have enabled a full presentation of statistics to be made respecting the forest crop of the country. Among the important items for which the reports are incomplete may be mentioned wood used as fuel and for the manufacture of charcoal, material for wood pulp and for distilled products, uncultivated vegetable substances used in the manufacture of medicines, uncultivated nuts, wood used for fencing, and timber cut for railway ties and for mining.

It will be observed that the data contained in Table 2 for "Lumber mills and saw mills", under the head of "Materials used", show 13,087,846 thousand feet (board measure) of logs purchased during the census year, for which the sum of $92,677,446 was paid, and this material for the mill should appear as the product of the logger. That the total reported for this class of product is quite deficient is indicated by its discrepancy from the quantity known to have been purchased and used during the census year by lumber and saw mills.

Although the totals do not represent the industries in their entirety, the statistics are valuable as showing the relations of capital, wages, materials, and miscellaneous expenses to the value of product in various sections of the country, and they are summarized for the United States under these heads, as follows:

TIMBER PRODUCTS NOT MANUFACTURED BY MILLING ESTABLISHMENTS, INCLUDING TAR AND TURPENTINE: 1890.

ITEMS.	CLASSIFICATION OF ESTABLISHMENTS.		
	Total.	Timber products.	Tar and turpentine.
Number of establishments reporting	2,276	1,606	670
Capital:			
Direct investment	$65,603,461	$61,541,086	$4,062,375
Value of hired property	$1,423,318	$1,396,818	$26,500
Miscellaneous expenses	$3,887,026	$3,708,364	$178,662
Average number of employés (aggregate)	61,457	46,142	15,315
Total wages	$14,287,099	$11,353,608	$2,933,491
Officers or firm members:			
Average number	956	907	49
Total wages	$541,503	$514,559	$26,944
All other employés:			
Average number	60,501	45,235	15,266
Total wages	$13,745,596	$10,839,049	$2,906,547
Animals in use:			
Average number	26,853	22,053	4,800
Cost of keep	$1,847,679	$1,479,426	$368,253
Cost of materials used	$13,513,118	$11,006,678	$2,506,440
Value of products	$42,367,186	$34,289,807	$8,077,379

TAR AND TURPENTINE.

Owing to its peculiar conditions and its economic importance, a distinct report was obtained for the manufacture of tar and turpentine. A special schedule of inquiry was sent to all manufacturers whose post office addresses could be obtained. The data thus obtained are shown in detail in Table 8.

The following comparative summary presents the leading statistics of the tar and turpentine industry by totals for the United States, as reported at the censuses of 1870, 1880, and 1890:

COMPARATIVE SUMMARY, TAR AND TURPENTINE: 1870, 1880, AND 1890.

ITEMS.	1870 (a)	1880	1890
Number of establishments reporting	227	508	670
Capital (b)	$902,225	$1,866,390	$4,062,375
Miscellaneous expenses	(c)	(c)	d$546,915
Average number of employés (aggregate)	2,638	10,535	15,315
Total wages	$476,284	$1,623,061	$2,933,491
Officers or firm members:			
Average number	(c)	(c)	49
Total wages	(c)	(c)	$26,944
All other employés:			
Average number	(c)	(c)	15,266
Total wages	(c)	(c)	$2,906,547
Cost of materials used	$2,146,090	$2,324,637	$2,506,440
Value of products	$3,585,225	$5,876,983	$8,077,379

a See remarks in regard to the depreciated currency of 1870, page 595.
b Value of hired property is not included in the capital reported in 1890, because it was not included in the reports of previous census years.
c Not reported.
d Includes cost of keep of animals.
e Not reported separately.

The principal products consist of spirits of turpentine and resin, and the quantity and value of each, as reported for the respective states at the census of 1890 are shown in the following statement:

QUANTITY AND VALUE OF SPIRITS OF TURPENTINE AND RESIN, BY STATES: 1890.

STATES.	SPIRITS OF TURPENTINE.		RESIN.	
	Barrels.	Value.	Barrels.	Value.
The United States	346,524	$5,459,115	1,429,154	$2,413,757
Florida	7,598	126,929	31,000	64,780
Georgia	189,558	2,732,042	670,588	1,474,353
Mississippi	12,078	181,142	60,150	89,887
North Carolina	72,888	1,293,086	365,233	377,310
South Carolina	60,873	1,039,421	283,116	383,167
All other states (a)	3,529	86,495	19,067	24,260

a Includes Alabama and Missouri.

TIMBERED LAND AND STANDING TIMBER.

The collection of accurate and comprehensive statistics relating to timbered land and the quantity of timber thereon is quite difficult, and the work of the Eleventh Census was therefore restricted to obtaining information respecting timbered land owned by those manufacturers using standing timber, logs, or bolts for their raw material, the term "merchantable timber" being defined as comprehending all timber which could be manufactured into lumber fit for market. For convenience of report, the manufacturing establishments were divided into two classes, one of which embraced all those operating any kind of mill, and the other was intended to include all other productive forest industries not conducted by mills.

No attempt was made at the Eleventh Census to ascertain the total quantity of merchantable timber standing in any of the states. Attempts have been made by several state governments to obtain it, but with unsatisfactory results. For this reason the census inquiry was limited to those lines upon which it was believed the most accurate information was accessible. The reports obtained from manufacturers respecting standing timber owned by them are believed to have peculiar value, because their timbered land is usually thoroughly explored and its product carefully estimated, but the totals relating to such timber fall far short of the total quantity of merchantable timber in the United States.

The question as to capital invested in timbered land and standing timber required for its answer a specific report of the amount invested in such lands as are not tributary to the mills operated by the establishments in question, also the amount invested in timbered land or standing timber which is tributary to such mills. The latter amount only is stated in Table 2, as forming a part of the operative capital of mill establishments.

There is reason to believe that the amounts reported under the head of "Capital invested" in timbered land in some instances are no criterion of the present value of the land, because it has been partly stripped of timber and the investment does not appear to have been credited with the value of such timber. To what extent this affects the totals the census data furnish no means of accurately determining.

It should be understood that the items of capital invested, area of timbered land, and principal varieties of timber are statements of fact; the items of quantity of merchantable standing timber and its value are estimated.

To what extent the result approaches the total forest area or the total quantity of standing timber in the respective states can not be determined, as complete data are not available.

So far as complete reports were received, the data presented in the following statement may therefore be considered as showing the investment in timbered land by the manufacturers of lumber and cognate products only, the area in acres of such land in the respective states, its estimated average product per acre of merchantable timber, and the average value per 1,000 feet (board measure) of the timber as it stands in the forest. The area of the land as given under the head of "Ownership" shows the area owned according to location of the principal office of the establishment reporting, while under the head of "Location of land" the land is credited to the state in which it is located.

TIMBERED LAND OWNED BY MANUFACTURERS OF LUMBER AND COGNATE PRODUCTS, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	ACCORDING TO OWNERSHIP. (a)(b)			ACCORDING TO LOCATION OF LAND. (b) (c)				
	Number of establishments reporting.	Capital invested.	Area in acres.	Area in acres.	Average quantity of merchantable timber per acre. (Feet, board measure.)	Estimated total quantity of merchantable timber. (Number of 1,000 feet, board measure.)	Average value per 1,000 feet as standing timber.	Estimated total value.
The United States	9,757	$195,440,827	27,664,626	27,604,626	7,829	216,589,090	$1.89	$409,620,990
Eastern group	3,180	32,083,627	5,058,634	4,870,197	6,529	31,796,155	2.03	64,555,776
Maine	371	3,547,326	1,570,546	1,677,740	3,599	6,038,999	1.48	8,960,690
New Hampshire	256	2,199,973	465,461	370,991	6,546	2,428,659	2.03	4,934,024
Vermont	403	1,768,894	406,483	405,076	8,099	3,280,592	1.91	6,282,006
Massachusetts	223	704,998	43,826	24,829	11,173	277,417	3.30	915,515
Rhode Island	12	17,800	1,507	1,547	5,570	8,617	4.02	34,637
Connecticut	76	175,205	11,525	12,445	8,074	100,476	4.15	417,013
New York	707	4,683,615	986,106	963,676	5,631	5,426,638	1.99	10,803,652
Pennsylvania	1,066	18,793,104	1,560,208	1,400,851	10,104	14,154,701	2.25	31,888,080
New Jersey	38	137,550	8,405	8,355	4,986	41,660	5.60	233,253
Delaware	28	55,162	4,567	4,687	8,192	38,396	2.26	86,906
Lake group	1,192	110,616,505	10,702,226	9,787,930	6,638	64,973,573	3.26	212,037,525
Michigan	638	54,357,754	5,707,350	4,363,563	7,235	31,656,743	2.80	88,691,423
Wisconsin	444	42,263,259	3,968,917	4,153,698	6,223	25,850,239	3.81	98,547,423
Minnesota	110	13,995,492	1,025,959	1,270,669	5,876	7,466,591	3.32	24,798,679
Central group	1,637	13,424,796	2,490,784	2,499,297	4,719	11,795,030	2.44	28,823,522
Ohio	289	1,612,770	106,864	81,214	6,582	534,550	3.17	1,692,207
Indiana	340	992,086	62,871	60,501	6,278	379,839	5.03	1,911,009
Illinois	79	1,316,776	111,978	34,306	3,495	119,916	2.68	321,296
West Virginia	184	1,743,611	302,912	449,822	7,059	3,175,426	2.16	6,848,732
Kentucky	176	4,722,742	948,861	986,286	3,014	2,972,443	4.01	11,921,873
Tennessee	210	903,260	291,083	219,213	7,345	1,610,140	1.49	2,399,600
Missouri	359	2,133,551	663,215	667,955	4,495	3,002,716	1.24	3,728,805
Southern group	2,916	19,308,112	7,609,937	8,791,397	6,007	52,811,681	0.98	52,017,470
Maryland	141	402,675	38,358	50,323	7,167	360,644	2.86	1,032,136
Virginia	311	851,589	204,706	211,653	6,646	1,406,624	1.26	1,776,896
North Carolina	459	2,301,492	1,004,840	1,141,662	5,413	6,179,966	1.56	9,624,802
South Carolina	244	1,153,960	433,355	416,615	8,714	3,630,291	0.99	3,579,319
Georgia	301	2,610,885	1,381,230	1,403,810	4,657	6,536,972	0.86	5,653,174
Florida	129	2,276,311	1,087,775	867,786	3,743	3,248,014	0.99	3,213,998
Alabama	372	1,627,127	576,119	936,151	5,852	5,478,385	0.87	4,745,982
Mississippi	257	1,227,968	594,763	975,311	6,801	6,632,927	0.61	4,063,170
Louisiana	105	1,432,878	534,095	982,328	8,219	8,073,400	0.94	7,626,868
Arkansas	360	2,069,805	701,732	950,134	6,049	5,747,635	1.03	5,922,071
Texas	237	3,353,422	1,052,964	855,624	6,448	5,516,823	0.87	4,778,454

a The capital and land are credited to the state in which the principal office of the establishment is located.

b Includes government license to cut timber on 25,680 acres located in Canada.

c The land is credited to the state in which it is located.

TIMBERED LAND OWNED BY MANUFACTURERS OF LUMBER AND COGNATE PRODUCTS—Continued.

STATES AND TERRITORIES.	Number of establishments reporting.	ACCORDING TO OWNERSHIP.		ACCORDING TO LOCATION OF LAND.				
		Capital invested.	Area in acres.	Area in acres.	Average quantity of merchantable timber per acre. (Feet, board measure.)	Estimated total quantity of merchantable timber. (Number of 1,000 feet, board measure.)	Average value per 1,000 feet as standing timber.	Estimated total value.
Pacific group	671	$15,723,214	1,559,729	1,600,349	33,961	54,349,311	$0.94	$50,843,838
California	200	8,443,004	587,167	596,867	40,742	24,317,791	1.07	25,962,588
Oregon	223	2,231,380	229,343	249,111	35,242	8,779,193	0.62	5,407,212
Washington	248	5,048,830	743,219	754,371	28,172	21,252,327	0.92	19,474,038
Miscellaneous group	161	4,284,573	243,316	89,776	7,806	700,780	1.28	899,499
Colorado	58	148,980	68,930	68,930	6,968	480,334	1.10	526,260
Idaho	7	16,960	2,735	2,735	7,921	21,665	1.09	23,584
Indian territory				2,500	30,000	75,000	1.00	75,000
Iowa	56	4,040,128	161,775	5,735	4,716	27,049	3.65	98,683
Kansas	5	6,210	245	245	11,898	2,915	3.60	10,507
Montana	5	19,700	2,070	2,070	14,058	29,100	0.99	28,814
Nebraska	6	4,960	491	491	2,754	1,352	2.18	2,946
New Mexico	7	6,715	1,275	1,275	11,039	14,075	1.69	23,755
North Dakota	2	9,120	1,840	1,840	5,000	9,200	4.00	36,800
South Dakota	11	25,600	3,215	3,215	8,886	28,570	2.03	58,000
Utah	2	3,500	180	180	8,889	1,600	3.25	5,200
Wyoming	2	2,700	560	560	17,714	9,920	1.00	9,920
Canada (a)				25,680	6,330	162,560	2.73	443,360

a Includes government license to cut timber on 25,680 acres located in Canada.

EASTERN GROUP.

The principal varieties of timber reported in Maine comprise spruce at an average stumpage value of $1.50 per 1,000 feet, pine at $3.90, hemlock at $1.63, poplar at $2.35, birch at $1.12, and cedar at $2.58. A considerable range appears in the stumpage values reported, since they depend on so many conditions of growth and accessibility to market. The value of spruce varies from $1.00 to $3.00 per 1,000 feet; that of pine from $2.50 to $5.50, the minimum price being for second growth, or sapling pine, and the maximum for virgin timber. The values reported for hemlock include, in some cases, the value of the bark, the value of the stripped timber for manufacture into lumber being usually reckoned at from 50 cents to $1.00 per 1,000 feet. Maine contains a considerable growth of canoe birch, which is largely utilized for the manufacture of spools, shoe lasts, and pegs.

The principal variety of commercial timber reported in New Hampshire and Vermont is spruce, together with a considerable quantity of hemlock and some hard woods. The average area comprised by the individual reports is much less than that in Maine, and this fact may explain the larger average product per acre derived from the smaller holdings. A considerable quantity of pine, mostly second growth, is reported in New Hampshire. The timber of chief economic value in Massachusetts, Rhode Island, and Connecticut comprises pine of second growth and chestnut.

The principal commercial timber of northern New York consists of spruce, having an average value of $1.72 on the stump, interspersed with hemlock, cedar, and occasional pine groves. Stated in their rank, according to the quantity reported, the commercial timbers of Pennsylvania, and their average stumpage value, are hemlock, $1.45; pine, $4.45; chestnut, $3.00; oak, $3.66; maple, $3.27; birch, $5.00; cherry, $10.00, and beech, $2.00. The timber growth in New Jersey and Delaware is not sufficient to give it economic importance, what is manufactured being for local use and consisting principally of pine, oak, chestnut, and cedar.

LAKE GROUP.

This group stands first in the quantity and value of its forest products, which consist principally of white pine lumber, although enough remains of the hard wood, which formed the original forest cover for the southern portion of Michigan, to furnish material for important industries. The principal body of white pine now remaining in Michigan is found in the northern peninsula in conjunction with the pine of Wisconsin, whose principal forest area is in the northern half of the state. The bulk of the white pine now standing in the United States is located in the northeastern part of Minnesota and is tributary to the Mississippi river and to Lake Superior. The consumption in Michigan, Wisconsin, and Minnesota of merchantable standing timber of all varieties by the

manufacturing industries operating mills, whose reports are presented herewith, is shown to have aggregated about 11,000,000 thousand feet, board measure, during the census year, and it also appears that manufacturers' holdings of such timber will supply them but a few years longer at the present rate of consumption. The quantity of timber in reserve is principally standing on lands owned by the federal and state governments.

Selected varieties of commercial importance in the Lake group are given in the following statement, which also shows for each variety the average product of merchantable timber per acre and the average value on the stump:

TIMBERED LAND, LAKE GROUP, BY STATES: 1890.

[Board measure.]

VARIETIES.	MICHIGAN.		WISCONSIN.		MINNESOTA.	
	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.
Ash	8,397	$3.18				
Beech, birch, and maple	6,123	1.80	5,409	$1.69	2,786	$1.36
Cedar	5,153	1.38	3,825	1.64	3,000	1.62
Elm	1,907	1.18	5,762	3.34	a14,210	2.92
Hemlock	4,745	1.05	4,661	0.96		
Oak	7,086	3.50	4,756	2.96	4,843	3.00
White pine	6,053	4.67	5,398	4.00	5,738	3.21
White and Norway pine	7,889	3.52	10,092	3.49	b1,357	1.85

a Includes one report of 160 acres, containing elm and basswood, averaging 30,000 feet per acre.
b Includes 1,012,800 acres of railway land which average but 1,154 feet per acre; the remaining 68,617 acres average 4,347 feet per acre.

CENTRAL GROUP.

The predominant species or groups of species found in this group of states comprise the broad leaved trees described by Prof. G. S. Sargent at the Tenth Census under the head of "The deciduous forest of the Mississippi basin and the Atlantic plain". Selected varieties of commercial importance are given in the following statement, which shows for each variety its average product of merchantable timber per acre, and the average value per 1,000 feet, board measure, on the stump:

TIMBERED LAND, CENTRAL GROUP, BY STATES: 1890.

[Board measure.]

VARIETIES.	OHIO.		INDIANA.		ILLINOIS.		WEST VIRGINIA.		KENTUCKY.		TENNESSEE.		MISSOURI.	
	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.
Ash	7,073	$5.24											3,522	$0.77
Beech	9,756	2.21												
Cherry							500	$6.52						
Chestnut							12,000	1.50						
Cottonwood											6,045	$0.77	10,556	0.68
Cypress					5,000	$1.00							5,896	0.71
Elm	8,435	3.35												
Gum			10,518	$3.98					9,442	$1.70	6,852	1.97	3,186	0.65
Hickory	1,000	4.00							9,557	1.53			2,400	3.00
Maple	3,733	2.57												
Oak	11,077	4.30	6,383	4.75	2,986	2.90	7,096	2.00	5,115	1.58	3,587	1.35	4,252	1.80
Pine	5,000	1.38					5,604	1.64			4,388	1.24	5,009	1.23
Poplar	9,273	3.04	5,505	5.46			2,253	2.10	3,096	1.79	4,358	2.07	2,400	3.00
Spruce							14,994	2.50						
Sycamore	5,000	2.00			9,761	2.05							10,000	1.50

SOUTHERN GROUP.

The manufacture of lumber and the utilization of forest material constitute an important part of the extensive industrial development which has occurred in the southern states during the last decade. The consumption of the pine of North Carolina, Alabama, Mississippi, Louisiana, Texas, and Arkansas has been enormously increased, and the products have obtained a much wider domestic distribution, due to increased railway facilities and the constantly decreasing supply of timber in the older lumbering sections of the country. The following statement shows for the respective states comprising this group the average growth per acre and the average stumpage value in 1890 of selected varieties of timber of commercial importance:

TIMBERED LAND, SOUTHERN GROUP, BY STATES: 1890.

[Board measure.]

VARIETIES.	MARYLAND.		VIRGINIA.		NORTH CAROLINA.		SOUTH CAROLINA.		GEORGIA.		FLORIDA.		ALABAMA.		MISSISSIPPI.		LOUISIANA.		ARKANSAS.		TEXAS.	
	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.
Ash							3,000	$1.00											2,000	$1.50		
Cedar													15,825	$0.76							10,000	$0.76
Chestnut	1,000	$4.00																				
Cottonwood																			7.714	0.61	5,000	0.50
Cypress			6,769	$1.27	5,000	$1.48					14,698	$0.64	2,000	1.00	8,808	$1.61	8,254	$1.05	4,830	1.00		
Gum															5,723	0.59			9,840	0.54	2,000	0.75
Hemlock	15,000	2.50																				
Magnolia																	9,000	2.00				
Oak	5,401	3.56	8,779	1.18	8,868	1.22	6,500	3.44	8,600	$0.53			8,061	1.49	1,249	2.27			4,511	1.17	1,904	4.97
Poplar			10,000	1.48	9,310	4.69	2,000	1.50											5,000	1.25		
Walnut																			30,000	1.00		
Yellow pine	6,829	2.39	5,882	1.02	4,983	1.22	4,614	1.20	4,151	0.78	2,948	0.93	7,172	0.78	6,825	0.96	9,051	0.55	5,574	0.68	6,436	0.92

PACIFIC GROUP.

Among the various industrial groups of states, the Pacific group shows the greatest percentage of increase in lumber manufacture, this increase being caused principally by the great development in the state of Washington, which contains the heaviest continuous belt of forest growth in the United States.

The timber of California, Oregon, and Washington is noted for its great size and economic value, although its commercial value has just begun to appreciate, coincident with its increasing utilization for domestic consumption.

The following statement shows for the respective states composing this group the average growth per acre of selected varieties of commercial timber and their average value on the stump per 1,000 feet, board measure:

TIMBERED LAND, PACIFIC GROUP, BY STATES: 1890.

[Board measure.]

VARIETIES.	CALIFORNIA.		OREGON.		WASHINGTON.	
	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.	Average product per acre in feet.	Average value per 1,000 feet.
Cedar			20,353	$0.43	37,050	$0.59
Fir	12,425	$1.25	35,054	0.55	26,084	0.95
Pine	16,931	1.48	19,020	0.76	18,858	1.06
Redwood	51,749	1.14				

CALIFORNIA REDWOOD.

The narrow belt of redwood which extends along the western slopes of the coast range from the Bay Monterey to the northern boundary of the state is the most important forest of similar extent now standing. Few trees equal the redwood in economic value. No other forest can compare with this in productive capacity, and no other great body of timber in North America is so generally accessible or so easily worked. Single trees capable of producing 75,000 feet of lumber are not uncommon, while a yield of from 1,000,000 to 2,000,000 feet of lumber per acre is by no means rare.

Previous to 1880 the redwood had been practically destroyed in the neighborhood of San Francisco bay, both north and south, and through the entire extent of this forest the trees most accessible to streams and railroads had been culled. Heavy bodies of redwood are still standing, however, in the Santa Cruz region, and in Humboldt county, in the valleys of the Eel and Mud rivers, and Redwood creek. The largest number of mills engaged in the manufacture of redwood are located upon Humboldt bay, principally at Eureka and Arcata.

The following estimates of the quantity of accessible redwood standing within the limits of the Pacific coast redwood belt in 1890 were prepared by Mr. A. C. Tibbetts, secretary of the Humboldt Lumber Manufacturers' Association:

REDWOOD.

	FEET (B. M.).
Total	97,504,800,000
From Oregon boundary to the mouth of Redwood creek	12,012,000,000
From the mouth of Redwood creek to the mouth of Mud river	11,472,000,000
From the mouth of Mud river to the mouth of Eel river	11,232,000,000
From the mouth of Eel river to the mouth of Matole river	14,256,000,000
From the mouth of the Matole river to the mouth of Catonavia creek	12,864,000,000
From the mouth of Catonavia creek to the mouth of Russian river	34,668,800,000
In the Santa Cruz region	1,000,000,000

ESTIMATED CUT FOR THE CENSUS YEAR ENDING MAY 31, 1890.

	FEET (B M.).
Total	317,274,000
Sawed lumber	237,274,000
Sawed shingles and shakes	25,000,000
Split railroad ties	40,000,000
Split posts, shakes, etc	15,000,000

COMPARATIVE VALUES OF RAW MATERIAL AND PRINCIPAL PRODUCT.

The statement on the following page contains (1) the average value per 1,000 feet, board measure, of all timber reported as standing in each state; (2) the average value on the stump of the standing timber which was used by mill establishments; (3) the average price paid for logs bought by mill establishments; (4) the average value at the mill of sawed lumber of all kinds reported in feet, board measure.

VALUES OF RAW MATERIAL AND PRODUCT PER 1,000 FEET, BOARD MEASURE, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	Average value on stump of all standing timber reported.	LUMBER MILLS AND SAW MILLS. Average value on stump of standing timber manufactured during year.	Average cost of logs bought.	Average value of sawed lumber.
The United States	$1.89	$2.52	$7.08	$11.41
Eastern group	2.03	2.10	7.27	11.19
Maine	1.48	2.14	7.95	11.73
New Hampshire	2.03	1.96	6.67	10.87
Vermont	1.91	1.85	6.28	10.93
Massachusetts	3.30	2.49	8.78	14.11
Rhode Island	4.02	2.63	11.90	16.91
Connecticut	4.15	4.07	12.86	18.70
New York	1.99	1.89	7.96	11.79
Pennsylvania	2.25	2.14	6.22	10.24
New Jersey	5.60	4.05	11.80	19.08
Delaware	2.26	1.85	7.50	11.43
Lake group	3.26	3.78	7.01	11.53
Michigan	2.80	4.08	6.76	11.72
Wisconsin	3.81	3.58	7.08	11.26
Minnesota	3.32	2.82	7.74	11.47
Central group	2.44	2.79	8.42	14.19
Ohio	3.17	3.08	8.43	14.81
Indiana	5.03	6.06	9.67	16.79
Illinois	2.68	3.16	9.67	14.90
West Virginia	2.16	2.14	7.86	13.14
Kentucky	4.01	1.59	7.45	13.05
Tennessee	1.49	1.50	7.22	12.68
Missouri	1.24	1.25	8.18	11.73
Southern group	0.98	0.90	5.52	9.50
Maryland	2.86	2.68	7.34	12.11
Virginia	1.26	1.14	5.41	9.62
North Carolina	1.56	1.05	4.61	8.57
Southern group—Continued.				
South Carolina	$0.99	$0.92	$4.11	$8.51
Georgia	0.86	0.81	4.94	8.85
Florida	0.99	0.79	5.60	10.21
Alabama	0.87	0.90	5.89	9.28
Mississippi	0.61	0.94	4.60	9.68
Louisiana	0.94	0.91	7.31	12.66
Arkansas	1.03	0.81	5.60	9.44
Texas	0.87	0.75	5.37	9.03
Pacific group	0.94	1.13	5.67	11.08
California	1.07	1.52	5.95	12.62
Oregon	0.62	1.00	5.25	10.39
Washington	0.92	0.81	5.73	10.61
Miscellaneous group	1.28	1.44	9.62	13.04
Alaska			5.14	13.89
Arizona		1.00	9.75	19.98
Colorado	1.10	1.14	5.22	11.76
Idaho	1.00	10.00	20.17	31.92
Indian territory	1.09	0.52	8.02	11.28
Iowa	3.65	4.09	10.72	13.72
Kansas	3.60	6.12	8.39	16.23
Montana	0.99	0.51	5.82	10.71
Nebraska	2.18	1.54	5.86	11.32
New Mexico	1.69	1.56	7.24	11.23
North Dakota	4.00		5.25	10.33
Oklahoma			7.02	13.13
South Dakota	2.03	1.88	4.78	12.09
Utah	3.25	1.36	6.96	13.13
Wyoming	1.00	1.00	6.34	15.37

The difference between the cost of the raw material and the value of its product, as presented in this report, represents the cost of manufacture and profit, and its variation is due to local causes, such as the weight of crude material and cost of its transportation, proximity to market, mechanical and other methods of manufacture, also to the variety or kind of lumber used and character of product.

Table 1 presents in comparison the data relating to the lumber and saw mill industry as reported at the censuses of 1870, 1880, and 1890; only such items are shown as are common to the three census periods, therefore some of the totals do not agree with those shown in Table 2. This is caused by the difference in the form and scope of the inquiry of the census of 1890 as compared with those of preceding censuses, which necessitates the consolidation of some items for comparative purposes.

Table 2 shows in detail, by states and territories, the statistics relating to "Lumber mills and saw mills" as reported at the census of 1890.

Table 3 is a presentation of employés, average number of months employed, and average monthly earnings per employé for the lumber mill and saw mill industry. It shows, by totals for each state and territory, the average number of males above 16 years, females above 15 years, and children, with their average term of employment and average monthly earnings per employé, distributed into the following classes: (1) officers or firm members actively engaged in the industry or in supervision; (2) clerks; (3) operatives, skilled and unskilled. The employés classed as "Operatives, skilled and unskilled", are distributed into the four branches of the industry as conducted by milling establishments, namely: operations in the woods; transportation; mill operations other than planing mill, and planing mill. The classes "Officers and firm members" and "clerks" are not reported as engaged exclusively in any particular branch of the industry, therefore no subdivision of these two classes is shown.

Table 4 shows the various monthly rates of wages paid, and the average number of men, women, and children, except pieceworkers, employed at each rate for each of the four branches of the industry enumerated in the description of Table 3.

Table 5 presents in detail, by states and territories, the statistics concerning establishments engaged in the manufacture of timber products other than those produced by milling establishments.

Tables 6 and 7 show the data concerning employés and wages for this class of establishments.

Table 8 shows detailed statistics for the manufacture of tar and turpentine.

The average number of months employed and the average monthly earnings, as shown in Tables 3 and 6, are computed from individual returns. The average number of employés reported by each establishment is multiplied by the number of months embraced by the term of operation. Aggregating such results of individual returns, the number of months required for 1 employé to perform the labor is obtained. This number divided by the number of employés gives the true average number of months employed, and divided into the total wages, the true average monthly earnings.

The totals for some items shown in the accompanying tables will not agree with the totals for apparently the same items given in the tables on manufactures in Part I. This is due to the fact that the tables in Part I present the figures under general heads common to all classes of industry, which necessitates combinations of a different character from those adopted for this report.

TABLE 1.—COMPARATIVE STATEMENT, LUMBER MILLS AND SAW MILLS, BY STATES AND TERRITORIES: 1870, 1880, AND 1890.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital. (b)	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES. (a)					Cost of materials used. (c)	Value of products, including receipts from custom work and repairing.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
The United States	d1870	25,832	$143,493,232	149,997	$40,009,162	146,047	682	3,268	$103,343,430	$210,159,327
	1880	25,708	181,186,122	147,956	31,845,974	141,564	425	5,967	146,155,385	243,268,729
	1890	21,011	496,339,968	286,197	87,784,433	280,467	2,462	3,268	231,555,618	403,667,575
Alabama	1870	284	744,005	1,428	357,195	1,411	8	9	520,513	1,359,083
	1880	354	1,545,655	1,647	424,156	1,611	.....	36	1,608,635	2,649,634
	1890	437	7,225,170	6,123	1,836,721	5,949	8	166	4,481,362	8,135,996
Alaska (e)	1870	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	10	105,727	86	22,173	86	.....	.....	30,198	58,440
Arizona	1870	1	5,000	16	6,000	16	.....	.....	1,600	10,000
	1880	13	102,450	79	33,375	77	.....	2	131,786	215,918
	1890	4	212,975	97	58,150	97	.....	.....	126,765	248,790
Arkansas	1870	211	694,400	1,107	255,186	1,075	6	26	546,059	1,344,403
	1880	319	1,067,840	1,744	237,394	1,690	.....	54	1,070,395	1,703,848
	1890	523	6,818,943	6,712	2,068,870	6,658	12	42	4,783,378	8,800,017
California	1870	291	3,856,440	4,077	1,620,626	4,059	12	6	1,986,119	5,227,064
	1880	251	6,454,718	3,434	1,095,736	3,423	.....	11	2,242,503	4,428,950
	1890	221	15,833,636	4,588	1,994,565	4,551	31	6	4,356,045	8,453,964
Colorado	1870	32	132,700	218	78,711	217	1	.....	117,075	324,370
	1880	96	481,200	877	112,931	870	.....	7	700,294	1,051,295
	1890	109	838,656	904	323,413	897	7	.....	609,693	1,172,190
Connecticut	1870	393	775,391	908	242,990	908	.....	.....	940,665	1,541,038
	1880	300	657,300	797	178,336	699	.....	8	641,569	1,076,455
	1890	157	1,010,656	754	209,788	753	1	.....	741,942	1,236,736
Dakota (f)	1870	10	37,400	68	14,256	66	.....	2	32,772	72,280
	1880	39	113,750	290	54,974	286	.....	4	281,875	435,792
	1890	46	370,085	500	124,070	497	3	.....	216,802	451,882
Delaware	1870	80	290,424	311	70,823	308	.....	3	229,856	405,041
	1880	86	259,250	391	40,694	378	.....	13	243,375	411,060
	1890	47	252,791	560	104,386	490	.....	70	193,096	397,057
District of Columbia	1870	1	1,500	15	1,800	10	.....	5	20,000	30,000
	1880	1	25,000	25	6,000	25	.....	.....	34,000	50,000
	1890	(g)	.....	.....	.....	.....	.....	.....	.....	.....
Florida	1870	104	755,090	1,116	421,820	1,091	2	23	1,163,238	2,235,780
	1880	135	2,219,550	2,030	562,249	1,945	.....	85	1,867,213	3,060,291
	1890	202	5,398,499	4,239	1,398,120	4,147	29	63	2,733,322	5,424,307
Georgia	1870	532	1,718,473	2,976	667,628	2,913	11	52	1,616,527	4,044,375
	1880	655	3,101,452	3,392	554,085	3,298	.....	94	3,197,155	4,875,310
	1890	434	4,884,568	5,917	1,572,284	5,784	32	101	3,263,027	6,306,095
Idaho	1870	10	50,750	47	17,924	47	.....	.....	20,177	56,850
	1880	48	192,460	173	33,367	169	.....	4	230,566	349,635
	1890	41	419,880	372	125,220	368	2	2	187,097	429,990
Illinois	1870	511	2,542,530	3,100	817,212	3,059	2	39	2,163,655	4,546,769
	1880	640	3,295,483	3,851	787,867	3,652	.....	199	3,144,905	5,063,037
	1890	357	4,056,562	4,314	1,147,784	4,235	8	71	2,893,684	5,090,940
Indiana	1870	1,861	5,975,746	9,446	1,901,612	9,097	7	342	5,563,985	12,324,755
	1880	2,022	7,048,088	10,339	1,571,740	9,926	.....	413	9,627,097	14,260,830
	1890	1,603	11,238,573	15,822	4,773,752	15,269	251	302	10,568,376	19,964,293

a For purposes of comparison only the employés engaged at the mill and their wages are shown for 1890.
b Value of hired property is not included in the capital reported in 1890, because it was not included in the reports of previous census years.
c In 1890, for purposes of comparison, includes wages reported under the heads of "Logging" and "Cost of keep of animals", shown in Table 2.
d See remarks in regard to the depreciated currency of 1870, page 595; the totals for 1870 include the statistics reported for "Staves, shooks, and heading".
e No report received prior to 1890.
f North and South Dakota combined for 1890 to compare with Dakota territory for 1870 and 1880.
g None reported in 1890.

TABLE 1.—COMPARATIVE STATEMENT, LUMBER MILLS AND SAW MILLS, ETC.—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products, including receipts from custom work and repairing.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
Indian territory (a)	1870									
	1880									
	1890	3	$16,000	39	$12,800	39			$23,900	$41,950
Iowa	1870	545	3,925,001	3,782	995,962	3,563	17	202	3,302,782	5,794,285
	1880	328	4,946,390	2,989	825,244	2,526		463	4,141,885	6,185,628
	1890	137	17,487,825	7,011	2,153,582	6,647	99	265	7,945,831	11,829,065
Kansas	1870	195	642,055	1,161	282,662	1,153	1	7	822,028	1,736,381
	1880	146	262,975	516	66,757	507		9	447,449	682,697
	1890	27	70,865	120	16,179	118		2	43,298	85,521
Kentucky	1870	562	1,724,686	2,497	482,683	2,425	13	59	1,805,591	3,662,086
	1880	670	2,290,558	2,691	671,939	2,506	1	94	2,410,743	4,064,361
	1890	595	6,554,974	6,782	1,798,855	6,666	8	108	4,370,822	7,869,082
Louisiana	1870	152	541,800	1,054	284,953	1,038	2	14	519,938	1,212,037
	1880	175	903,950	976	200,063	943		33	1,187,059	1,764,640
	1890	122	5,586,598	3,091	1,249,460	3,039	38	14	3,073,144	5,599,744
Maine	1870	1,099	6,614,875	8,506	2,449,132	8,463	2	41	6,872,723	11,395,747
	1880	848	6,339,396	6,663	1,161,142	6,480		183	4,951,957	7,933,868
	1890	831	11,883,447	8,932	2,519,609	8,765	107	60	5,950,780	10,907,438
Maryland	1870	391	1,055,600	1,245	259,551	1,229		16	674,858	1,501,471
	1880	369	1,237,694	1,239	223,786	1,216		23	1,106,795	1,813,332
	1890	212	1,449,795	1,678	389,747	1,588	31	59	840,257	1,595,282
Massachusetts	1870	644	2,054,829	2,291	569,300	2,266		25	2,065,375	3,556,870
	1880	606	2,480,340	1,970	431,612	1,940		30	1,904,105	3,120,184
	1890	464	5,002,033	3,214	1,194,253	3,195	15	4	2,682,932	5,109,998
Michigan	1870	1,571	26,990,450	20,058	6,400,283	19,252	63	743	14,347,661	31,946,396
	1880	1,649	39,260,428	24,235	6,967,905	22,732	143	1,360	32,251,372	52,449,928
	1890	1,918	110,990,328	46,592	14,677,436	45,799	299	494	45,6-5,543	73,484,306
Minnesota	1870	207	3,311,140	2,952	880,028	2,899	14	39	2,193,965	4,299,162
	1880	234	6,771,145	2,854	924,473	2,732	22	100	4,529,055	7,366,038
	1890	317	28,321,062	10,783	3,383,765	10,740	16	27	13,670,811	21,013,010
Mississippi	1870	265	1,153,917	1,954	580,056	1,907	15	32	828,793	2,160,667
	1880	295	922,595	1,170	197,867	1,123		47	1,219,116	1,920,335
	1890	338	4,433,229	4,434	1,287,391	4,374	22	38	2,852,530	5,670,774
Missouri	1870	806	3,241,670	3,900	1,031,513	3,789	11	100	3,428,235	6,363,112
	1880	881	2,867,970	3,503	669,644	3,408		95	3,215,292	5,265,617
	1890	748	7,658,118	5,740	1,569,062	5,628	80	32	4,212,768	7,487,844
Montana	1870	31	146,000	161	80,965	161			172,098	430,957
	1880	36	208,200	142	47,945	142			278,098	527,695
	1890	30	831,323	629	325,497	628	1		546,575	1,178,380
Nebraska	1870	50	152,200	202	47,102	202			118,975	278,205
	1880	38	93,375	140	29,313	136		4	164,878	265,062
	1890	31	96,539	162	50,197	162			63,552	154,945
Nevada	1870	18	193,500	324	151,930	324			135,450	432,500
	1880	9	132,000	35	9,892	35			162,810	243,200
	1890	(b)								
New Hampshire	1870	723	2,428,193	3,398	725,304	3,379	7	12	2,471,427	4,286,142
	1880	680	3,745,790	3,104	548,556	3,056		48	2,272,991	3,812,012
	1890	531	6,222,380	4,651	1,459,929	4,490	116	45	2,471,858	5,017,062
New Jersey	1870	285	2,238,000	1,145	369,835	1,122		23	1,612,802	2,745,317
	1880	284	1,657,395	768	179,693	760		8	989,979	1,627,640
	1890	110	1,546,530	674	230,583	665	3	6	692,537	1,215,524
New Mexico	1870	12	47,100	63	35,425	63			40,083	121,225
	1880	26	74,675	172	24,240	172			117,055	173,930
	1890	26	193,335	330	161,981	328	2		172,321	389,761
New York	1870	3,510	15,110,981	15,409	3,438,601	14,720	44	645	11,228,613	21,238,228
	1880	2,822	13,230,934	11,445	2,162,972	11,056		389	9,119,263	14,356,910
	1890	1,664	20,734,448	13,164	3,598,607	12,729	216	219	8,716,806	16,457,811
North Carolina	1870	523	1,175,950	2,361	379,611	2,329	3	29	970,294	2,000,243
	1880	776	1,743,217	3,029	447,431	2,938		91	1,577,139	2,672,796
	1890	688	5,319,589	6,651	1,336,895	6,580	17	54	3,007,183	5,767,687
North Dakota (c)	1890	5	118,830	138	25,810	138			36,045	76,173
Ohio	1870	2,230	6,191,679	8,237	1,535,909	8,046	12	179	5,038,678	10,235,180
	1880	2,352	7,944,412	9,317	1,708,300	8,769		548	8,896,106	13,864,460
	1890	1,427	11,735,666	13,056	3,722,951	12,639	82	335	7,592,798	15,161,730
Oklahoma (d)	1890	8	16,605	35	6,570	35			13,900	27,200
Oregon	1870	165	913,262	693	261,785	666	2	4	358,273	1,014,211
	1880	228	1,577,875	579	242,154	566		13	1,331,342	2,030,463
	1890	300	7,542,835	3,777	1,660,671	3,752	21	4	2,979,202	5,994,915

a No report received prior to 1890.
b None reported in 1890.
c See Dakota.
d Part of Indian territory prior to 1890.

TABLE 1.—COMPARATIVE STATEMENT, LUMBER MILLS AND SAW MILLS, ETC.—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments reporting.	Capital.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.					Cost of materials used.	Value of products, including receipts from custom work and repairing.
				Aggregates.		Males above 16 years.	Females above 15 years.	Children.		
				Average number.	Total wages.					
Pennsylvania	1870	3,739	$24,804,304	17,427	$5,261,576	17,278	15	134	$14,940,096	$28,938,985
	1880	2,827	21,418,588	14,914	2,918,459	14,443	8	463	13,955,430	22,457,359
	1890	1,853	43,522,780	18,663	5,466,123	18,365	114	184	15,392,468	27,772,834
Rhode Island	1870	81	161,200	204	39,826	194	1	9	157,079	257,258
	1880	49	144,250	152	33,143	139	.....	13	120,888	240,579
	1890	29	125,921	186	62,108	185	1	.....	112,766	244,490
South Carolina	1870	227	583,425	1,212	209,806	1,183	1	28	581,499	1,197,005
	1880	420	1,056,265	1,468	221,963	1,431	.....	37	1,237,361	2,031,507
	1890	328	1,727,215	2,445	427,133	2,445	.....	.....	974,782	1,982,583
South Dakota (a)	1890	41	251,255	362	98,260	359	3	.....	180,757	375,709
Tennessee	1870	702	1,622,741	2,910	578,364	2,868	7	35	1,446,782	3,390,687
	1880	755	2,004,503	3,718	549,222	3,577	.....	141	2,142,885	3,744,905
	1890	787	7,186,127	8,148	2,194,615	8,004	22	122	5,019,282	8,941,995
Texas	1870	324	870,491	1,750	390,149	1,714	15	21	644,274	1,960,851
	1880	324	1,660,952	3,186	732,914	3,136	1	49	2,096,775	3,673,449
	1890	284	10,674,707	6,820	2,572,921	6,780	9	31	6,322,076	11,328,257
Utah	1870	95	338,500	541	139,533	538	.....	3	266,047	661,431
	1880	107	272,750	385	65,175	375	.....	10	238,274	375,164
	1890	30	196,983	228	61,756	227	1	.....	126,932	234,820
Vermont	1870	637	2,872,451	2,782	729,925	2,761	6	15	1,731,516	3,525,122
	1880	688	3,274,250	2,511	426,953	2,411	.....	100	2,021,868	3,258,816
	1890	736	7,615,495	6,381	1,699,847	6,271	53	57	3,823,608	6,843,817
Virginia	1870	605	979,386	2,283	343,823	2,254	16	13	860,949	2,111,055
	1880	907	2,122,925	4,011	540,231	3,922	.....	89	1,983,777	3,434,163
	1890	638	4,364,702	5,980	1,361,638	5,555	337	88	2,905,958	5,541,825
Washington	1870	46	1,285,202	474	388,830	474	.....	.....	580,259	1,307,585
	1880	37	2,456,450	499	200,539	495	.....	4	1,188,075	1,734,742
	1890	310	19,445,429	7,637	4,060,231	7,601	25	11	7,930,443	15,067,627
West Virginia	1870	343	981,950	1,515	349,368	1,484	3	28	682,180	1,478,399
	1880	472	1,668,920	2,183	459,945	2,057	.....	126	1,375,372	2,431,857
	1890	428	4,541,072	4,308	1,164,254	4,255	10	43	2,968,511	5,239,340
Wisconsin	1870	720	11,448,545	12,461	3,755,089	11,795	362	304	7,422,866	15,130,719
	1880	704	19,824,059	8,465	2,257,218	7,748	250	467	12,471,473	17,952,347
	1890	853	84,419,243	32,755	10,046,413	32,281	332	142	33,212,511	52,115,739
Wyoming	1870	8	110,500	213	104,500	211	1	1	99,000	268,000
	1880	7	26,700	38	6,380	38	.....	.....	27,350	40,990
	1890	17	160,049	113	42,078	111	1	1	52,166	124,462

a See Dakota.

TABLE 2.—DETAILED STATEMENT, LUMBER MILLS AND

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.								
				Direct investment.							
						Logging (conducted by milling establishments).					
			Value of hired property.	Aggregate.	Timbered land (tributary to mill).	Total.	Tools, implements, and live stock.	Railways and equipment.	Canals or chutes.	River improvements.	Vessels used in transportation.
1	The United States	21,011	$9,170,707	$496,339,968	$129,124,147	$60,442,226	$13,695,450	$10,555,328	$462,011	$2,232,188	$3,743,422
2	Alabama	437	145,420	7,225,170	1,452,039	1,477,428	321,502	717,105	125,301	19,250	30,300
3	Alaska	10	21,350	105,727		2,198	478				1,720
4	Arizona	4		212,975		100,000	50,000				
5	Arkansas	523	145,720	6,818,943	1,570,740	785,696	334,083	311,970	5,400	5,825	41,580
6	California	221	64,600	15,833,636	6,042,554	3,674,633	662,983	1,897,948	69,050	72,300	486,878
7	Colorado	109	31,781	838,656	77,710	160,381	126,946	400	3,500	250	200
8	Connecticut	157	43,780	1,010,656	92,040	59,027	37,032				150
9	Delaware	47	24,196	252,791	37,410	28,847	20,447				2,000
10	Florida	202	128,110	5,398,499	1,157,426	705,920	149,010	442,115	2,500	5,050	56,100
11	Georgia	434	86,225	4,884,568	1,056,915	1,070,560	419,213	577,391	200	1,710	14,350
12	Idaho	41	9,250	419,880	12,600	67,225	33,075	1,400	3,300	1,000	
13	Illinois	357	257,015	4,056,562	236,691	265,951	78,424	390		2,800	35,750
14	Indiana	1,603	596,048	11,238,573	771,040	691,632	338,059	2,591	110	100	66
15	Indian territory	3		16,000		400	400				
16	Iowa	137	161,760	17,487,825	3,990,528	1,398,050	48,525	2,550	5,000	2,600	23,174
17	Kansas	27	5,075	70,865	4,210	7,775	6,350	75			
18	Kentucky	595	372,734	6,554,974	369,360	427,701	119,324	44,260	9,590	54,150	2,175
19	Louisiana	122	71,130	5,586,598	698,963	668,439	148,881	175,640			19,500
20	Maine	831	448,146	11,883,447	1,678,897	1,516,734	483,120	2,260	13,285	56,750	145,350
21	Maryland	212	116,970	1,449,795	208,980	141,755	72,495	4,425		12,000	22,500
22	Massachusetts	464	247,950	5,002,033	320,240	332,171	200,711	2,085		75,644	
23	Michigan	1,918	863,150	110,990,328	35,585,723	14,806,556	2,595,190	1,233,509	7,967	425,191	1,651,618
24	Minnesota	317	314,175	28,321,062	5,860,444	4,547,065	664,837	169,200	24,038	281,597	74,500
25	Mississippi	338	155,300	4,433,229	745,253	598,851	131,535	312,373	2,400		44,700
26	Missouri	748	312,795	7,658,118	1,107,314	734,904	251,914	135,481	400	2,260	52,000
27	Montana	30		831,323	17,780	61,060	32,795	2,000		25,050	
28	Nebraska	31	34,400	96,539	4,200	2,240	1,750				
29	New Hampshire	531	230,060	6,222,380	1,208,350	476,635	280,215	80,700	20,200	4,250	1,000
30	New Jersey	110	91,775	1,546,530	102,951	49,230	38,130	50			
31	New Mexico	26	6,750	193,335	4,890	31,100	28,050				
32	New York	1,664	933,260	20,734,448	3,477,995	2,306,560	524,141	185,400	3,850	95,950	50,680
33	North Carolina	688	91,622	5,319,589	1,128,912	523,465	207,302	157,845	1,620	9,269	43,800
34	North Dakota	5		118,830	8,120						
35	Ohio	1,427	984,075	11,735,666	1,281,075	987,921	320,313	23,510	2,050		11,160
36	Oklahoma	8	8,400	16,605							
37	Oregon	300	89,100	7,542,835	1,744,731	926,802	260,109	211,891	18,175	32,825	92,425
38	Pennsylvania	1,853	975,450	43,522,780	15,338,632	4,747,921	928,380	1,200,889	27,660	190,099	3,230
39	Rhode Island	29	22,250	125,921	11,150	6,370	4,570				
40	South Carolina	328	78,225	1,727,215	380,633	333,333	161,000	132,475	8,150	3,000	3,150
41	South Dakota	41	7,100	251,255	22,400	28,650	23,850				
42	Tennessee	787	262,950	7,186,127	554,775	402,292	183,784	30,357	5,325	5,650	5,720
43	Texas	284	84,515	10,674,707	2,806,901	1,256,612	356,995	730,615	900	21,287	35,675
44	Utah	30	12,900	196,983	2,100	20,021	8,471			1,000	
45	Vermont	736	95,540	7,615,495	1,439,680	754,603	366,923	153,450	4,600	33,025	2,750
46	Virginia	638	176,700	4,364,702	647,302	490,348	248,805	152,343	400	3,675	6,600
47	Washington	310	133,200	19,445,429	3,829,172	975,376	279,038	191,923	33,760	18,259	171,400
48	West Virginia	428	15,800	4,541,072	852,011	540,051	149,859	118,035	7,460	37,750	1,200
49	Wisconsin	853	206,455	84,419,243	31,181,210	11,149,790	1,995,001	1,150,677	55,820	733,231	610,001
50	Wyoming	17	7,500	160,049	2,100	1,947	1,375				

SAW MILLS, BY STATES AND TERRITORIES: 1890.

CAPITAL—continued.											
Direct investment—Continued.											
Logging, etc.—Continued.		Mill plant.									
			Lumber and saw mills.				Planing mills operated by lumber manufacturers.				
Saw logs, bolts, hewed timber, ties, posts, etc. (not delivered at mill).	All other capital invested specifically in logging.	Total.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Dry kilns.	
$25,178,891	$4,574,936	$134,513,342	$121,562,226	$25,075,154	$28,760,003	$67,727,069	$11,244,354	$2,328,131	$2,513,531	$6,402,692	$1,706,762	1
188,400	75,570	2,790,443	2,272,771	373,282	515,004	1,384,485	292,093	39,710	74,690	177,693	225,579	2
		94,505	88,205	4,250	26,350	57,605	6,300			6,300		3
5,000	45,000	80,200	65,200	600	10,500	54,100	15,000		5,000	10,000		4
60,554	26,284	2,533,013	2,149,340	348,442	442,826	1,358,072	310,811	26,673	64,497	219,641	72,862	5
385,538	99,936	2,997,654	2,801,679	392,420	822,635	1,586,624	184,975	19,280	34,195	131,500	11,000	6
9,695	19,390	278,245	219,295	16,745	22,950	179,600	58,450	18,900	10,500	29,050	500	7
18,395	3,450	503,261	488,361	158,750	114,025	215,586	14,400	1,550	3,150	9,700	500	8
6,200	200	132,660	125,310	18,665	26,545	80,100	7,350	400	2,300	4,650		9
44,350	6,795	2,236,115	2,034,215	511,302	396,025	1,126,888	184,038	24,595	38,383	121,060	17,862	10
18,102	39,594	1,818,299	1,672,680	159,191	376,123	1,137,366	125,063	13,895	25,125	86,043	20,556	11
25,000	3,450	190,400	173,500	17,210	29,715	126,575	16,900		2,800	14,100		12
137,387	11,200	1,279,565	1,190,830	190,240	236,847	763,743	73,135	7,025	17,160	48,950	15,600	13
285,630	65,076	4,422,715	4,059,830	639,212	742,730	2,677,888	324,435	26,630	99,765	198,040	88,450	14
		6,000	6,000	400	300	5,300						15
1,115,581	200,620	3,082,964	2,757,314	629,898	636,135	1,491,281	279,050	36,000	48,200	194,850	46,600	16
1,200	150	42,280	35,680	1,460	2,770	31,450	6,500		2,500	4,000	100	17
171,817	26,385	2,538,533	2,319,648	261,828	597,280	1,460,540	195,345	17,960	49,885	127,500	23,540	18
226,456	97,962	2,089,452	1,849,402	552,620	328,438	968,344	203,625	77,925	51,700	74,000	36,425	19
703,544	112,425	4,256,129	4,047,467	785,586	1,351,520	1,910,361	189,837	31,970	56,562	101,305	18,825	20
24,640	5,695	635,581	586,356	76,978	105,060	404,318	49,075	8,650	7,575	32,850	150	21
34,856	18,875	2,142,745	1,898,175	528,185	571,458	798,532	221,045	51,725	63,975	105,345	23,525	22
8,478,133	414,948	22,055,487	21,195,746	4,009,096	5,196,922	11,989,728	761,854	149,730	173,343	438,781	97,887	23
2,187,736	1,145,157	6,969,265	6,027,731	1,912,326	1,165,250	2,950,155	872,817	350,485	165,021	357,311	68,717	24
93,740	14,103	1,856,423	1,501,053	162,435	350,430	988,188	280,225	18,850	90,925	170,450	75,145	25
268,031	24,818	3,314,990	2,703,430	894,891	450,937	1,357,602	577,670	406,065	42,025	129,580	33,890	26
845	370	200,300	172,875	25,375	33,150	114,350	23,425	600	4,825	18,000	4,000	27
490		51,895	51,895	3,470	9,500	38,925						28
66,295	23,975	2,366,999	2,213,259	362,934	787,859	1,062,466	133,115	23,655	34,600	74,860	20,625	29
7,600	3,450	760,417	673,717	368,712	123,905	181,100	86,400	51,450	9,750	25,200	300	30
2,000	1,050	108,637	106,236	3,751	14,385	88,100	2,401	1	200	2,200		31
1,215,090	231,449	8,037,385	7,336,508	1,837,528	2,206,735	3,292,245	612,427	83,875	150,480	378,072	88,450	32
66,400	37,229	2,449,756	2,109,241	291,728	381,018	1,436,495	165,385	16,425	29,360	119,600	175,130	33
		58,300	54,300	9,800	6,950	37,550	4,000		1,500	2,500		34
567,978	62,890	5,067,882	4,684,297	887,494	985,382	2,811,421	358,635	59,300	94,125	205,210	24,950	35
		11,380	11,380	280	1,350	9,750						36
272,407	38,970	2,900,413	2,641,433	752,808	512,440	1,376,185	253,705	33,835	51,630	168,240	5,275	37
2,105,037	292,626	9,037,529	8,469,960	1,495,464	2,149,982	4,824,514	541,640	68,248	116,958	356,434	25,929	38
1,800		76,735	70,735	13,870	17,115	39,750	6,000			6,000		39
17,193	8,365	761,569	730,804	125,752	103,396	501,656	25,500	2,510	4,700	18,350	5,205	40
4,100	700	104,025	95,875	6,115	16,860	72,900	8,075	400	400	7,275	75	41
158,240	13,816	2,798,661	2,441,654	574,051	426,791	1,440,812	337,772	56,420	99,010	182,342	19,235	42
90,700	120,440	3,223,393	2,477,142	298,809	517,220	1,661,113	590,360	37,990	101,370	451,000	155,891	43
10,200	350	78,502	67,272	4,530	8,420	54,322	11,230	4,300	2,600	4,330		44
144,470	49,325	2,642,782	2,365,357	310,145	791,027	1,264,185	245,915	26,310	43,600	176,005	31,510	45
35,678	42,847	2,078,284	1,773,063	408,614	262,787	1,101,662	193,236	32,905	55,965	104,366	111,985	46
209,105	71,900	8,016,691	7,225,703	2,329,706	1,517,282	3,378,715	712,330	282,300	88,850	341,180	78,658	47
165,198	60,549	1,309,417	1,159,159	131,341	169,371	858,447	118,661	12,660	29,086	76,915	31,597	48
5,547,568	1,057,492	13,943,589	12,299,266	2,185,563	3,189,303	6,924,400	1,544,089	202,929	459,246	881,914	100,234	49
512	60	81,877	61,877	1,302	9,000	51,575	20,000	4,000	6,000	10,000		50

TABLE 2.—DETAILED STATEMENT, LUMBER MILLS AND

	STATES AND TERRITORIES.	CAPITAL—continued.				MISCELLANEOUS EXPENSES.					
		Direct investment—Continued.									
		Live assets.									
		Total.	Logs and bolts at mill.	Lumber or other products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Amount paid for contract sawing.
1	The United States	$172,260,253	$31,437,143	$74,094,959	$66,728,151	$20,136,273	$825,593	$3,179,127	$2,922,030	$5,084,086	$261,368
2	Alabama	1,505,260	203,545	570,388	731,327	291,915	16,145	30,175	46,909	100,270	1,000
3	Alaska	9,024	2,874	4,579	1,571	5,252	2,227			3,025	
4	Arizona	32,775	5,150	26,750	875	10,485		85	3,000	5,175	
5	Arkansas	1,929,494	219,284	838,787	871,423	279,852	13,770	37,604	34,699	97,571	
6	California	3,118,795	424,678	1,308,913	1,385,204	537,224	7,601	112,985	53,144	174,711	3,180
7	Colorado	322,320	11,042	133,399	177,879	45,767	2,940	6,763	1,771	18,939	
8	Connecticut	356,328	32,864	198,275	125,189	38,799	3,451	4,131	5,166	15,920	
9	Delaware	53,874	3,278	23,295	27,301	7,894	1,257	787	1,353	2,965	
10	Florida	1,299,038	174,799	538,784	585,455	265,080	15,895	31,000	39,117	75,131	525
11	Georgia	938,794	165,180	343,165	430,449	202,800	8,075	28,676	23,979	73,695	
12	Idaho	149,655	20,005	77,910	51,740	27,858	550	2,722	917	7,260	
13	Illinois	2,274,355	329,369	1,152,547	792,439	352,783	20,489	22,067	31,494	70,463	
14	Indiana	5,353,186	919,979	2,115,659	2,317,548	616,250	50,112	73,837	61,207	207,753	
15	Indian territory	9,600	3,400	3,000	3,200	1,000		200		200	
16	Iowa	9,016,283	355,706	4,108,847	4,551,730	633,997	12,298	67,634	104,446	139,510	
17	Kansas	16,600	1,700	7,975	6,925	4,109	277	409	226	1,230	
18	Kentucky	3,219,380	1,236,709	1,080,076	902,595	380,272	27,086	22,583	34,354	86,095	
19	Louisiana	2,129,744	578,730	581,161	969,853	213,535	7,626	28,370	45,037	54,883	
20	Maine	4,431,687	1,592,945	1,562,439	1,276,303	546,396	87,457	67,229	67,140	141,190	26,606
21	Maryland	463,479	68,861	206,696	187,922	54,246	10,318	6,309	6,804	17,464	
22	Massachusetts	2,206,877	563,537	856,109	787,231	312,654	21,647	34,085	36,117	60,495	
23	Michigan	38,542,562	5,623,802	16,990,104	15,928,656	4,258,006	81,092	992,414	675,082	971,551	
24	Minnesota	10,944,288	2,091,540	4,698,078	4,154,670	1,296,220	35,694	165,098	249,732	249,967	
25	Mississippi	1,232,702	261,232	404,331	567,139	205,833	12,805	27,158	19,397	82,128	
26	Missouri	2,500,910	185,707	1,373,371	941,832	365,757	19,388	33,381	36,795	85,589	
27	Montana	552,183	181,145	158,390	212,648	41,545		5,019	3,815	11,599	
28	Nebraska	38,204	5,027	19,538	13,639	6,714	2,287	349	176	1,700	
29	New Hampshire	2,170,396	699,609	747,226	723,561	221,162	18,813	36,550	30,942	79,210	
30	New Jersey	633,932	168,534	199,949	265,449	48,089	7,799	6,115	6,520	8,631	
31	New Mexico	48,708	3,329	15,210	30,169	13,812	480	1,520	1,565	6,954	
32	New York	6,912,508	1,611,965	2,735,693	2,564,850	980,523	71,894	84,850	109,336	213,647	
33	North Carolina	1,217,456	245,195	447,750	524,511	213,801	7,924	16,324	35,609	77,581	16,000
34	North Dakota	52,410	1,610	35,640	15,160	3,745		3,223		222	
35	Ohio	4,398,788	893,471	2,013,107	1,492,210	626,994	71,288	67,095	81,064	161,457	
36	Oklahoma	5,225	3,490	700	1,035	2,075	1,520			295	
37	Oregon	1,970,889	389,666	601,977	979,246	334,244	12,432	33,494	23,046	108,971	
38	Pennsylvania	14,398,698	2,600,643	6,228,791	5,569,264	1,326,626	70,375	186,874	202,155	301,931	159,568
39	Rhode Island	31,666	1,800	15,241	14,625	7,698	2,325	433	1,220	2,650	
40	South Carolina	251,680	47,229	101,606	102,845	68,560	6,567	7,889	4,649	22,451	16,000
41	South Dakota	96,180	9,245	37,460	49,475	12,707	440	2,479	1,277	5,775	
42	Tennessee	3,430,399	609,749	1,878,069	942,581	340,635	18,604	30,212	48,018	103,861	
43	Texas	3,287,801	369,407	1,249,727	1,668,667	435,657	5,748	40,361	66,304	137,845	2,275
44	Utah	96,360	10,800	30,285	55,275	8,542	818	938	145	1,760	
45	Vermont	2,778,430	775,036	1,366,867	636,527	281,835	8,547	31,062	51,104	91,990	3,750
46	Virginia	1,148,768	223,070	477,656	448,042	228,723	10,349	15,488	35,999	66,024	11,164
47	Washington	6,624,190	1,092,989	1,765,185	3,766,016	762,680	16,630	107,737	89,326	278,887	19,000
48	West Virginia	1,839,593	453,636	943,888	442,069	163,140	5,510	21,146	19,603	50,490	2,300
49	Wisconsin	28,144,654	5,955,207	13,791,991	8,397,456	3,056,080	26,503	682,970	532,156	604,190	
50	Wyoming	74,125	9,375	28,375	36,375	6,702	540	1,297	115	2,785	

a Includes employés engaged by contractors, estimated at 42,025.

SAW MILLS, BY STATES AND TERRITORIES: 1890—Continued.

MISCELLANEOUS EXPENSES—continued.		AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.												
		Summary.								Logging.				
		Aggregate.		Males above 16 years.		Females above 15 years.		Children.		Total.		Employed in woods.		
Interest paid on cash used in the business.	All sundries not elsewhere reported.	Average number. (a)	Total wages.	Number. (a)	Wages.	Number.	Wages.	Number.	Wages.	Average number. (a)	Total wages.	Number.	Wages.	
$4,076,113	$3,787,956	460,349	$126,776,227	454,619	$125,931,686	2,462	$444,324	3,268	$400,217	174,152	$38,991,794	97,218	$22,920,082	1
31,496	65,920	10,493	2,997,960	10,319	2,971,623	8	2,490	166	23,847	4,370	1,161,239	2,182	584,125	2
		91	22,735	91	22,735					5	562	1	155	3
25	2,200	164	104,600	164	104,600					67	46,450	42	26,650	4
56,300	39,908	10,508	3,146,959	10,454	3,141,319	12	560	42	5,080	3,796	1,078,089	2,762	785,818	5
100,504	85,099	9,192	3,863,930	9,155	3,853,554	31	8,526	6	1,850	4,604	1,869,365	3,698	1,498,777	6
8,716	6,638	1,342	502,088	1,335	500,953	7	1,135			438	178,675	337	135,089	7
5,245	4,886	1,156	392,275	1,155	391,675	1	600			402	122,487	304	89,181	8
902	630	688	128,536	618	125,986			70	2,550	128	24,150	88	15,968	9
45,372	58,040	5,875	1,950,562	5,783	1,937,554	29	6,050	63	6,958	1,636	552,442	826	281,468	10
36,363	32,012	9,513	2,500,739	9,380	2,487,341	32	5,550	101	7,848	3,596	928,455	2,425	622,956	11
2,809	3,600	422	139,210	418	138,510	2	500	2	200	50	13,990	38	12,490	12
30,688	177,582	5,302	1,346,662	5,223	1,337,129	8	1,610	71	7,923	988	198,878	485	98,260	13
80,199	143,142	18,371	5,574,097	17,818	5,481,110	251	51,066	302	41,921	2,549	800,345	1,519	486,807	14
600		51	18,100	51	18,100					12	5,300	12	5,300	15
78,482	231,627	7,303	2,218,410	6,939	2,162,576	99	22,151	265	33,683	292	64,828	19	4,286	16
377	1,590	155	23,264	153	23,064			2	200	35	7,085	29	5,885	17
89,487	120,667	8,176	2,228,471	8,060	2,215,600	8	1,752	108	11,119	1,394	429,616	1,260	388,597	18
27,769	49,850	4,081	1,599,395	4,029	1,584,106	38	12,639	14	2,650	990	349,935	505	173,789	19
108,039	48,735	17,134	3,475,025	16,967	3,447,034	107	21,272	60	6,719	8,202	955,416	3,941	497,856	20
11,386	1,965	2,210	490,665	2,120	480,284	31	5,300	59	5,081	532	100,918	421	77,923	21
56,734	103,576	4,289	1,598,572	4,270	1,593,733	15	4,499	4	340	1,075	404,319	885	340,739	22
967,402	570,465	81,027	22,389,411	80,234	22,267,919	299	60,236	494	61,256	34,435	7,711,975	21,085	5,025,546	23
334,984	260,745	19,724	4,934,813	19,681	4,898,362	16	2,682	27	3,769	8,941	1,521,048	3,799	699,663	24
37,630	26,715	7,680	2,140,229	7,620	2,132,755	22	2,554	38	4,920	3,246	852,838	1,638	430,117	25
79,586	111,018	8,153	2,184,471	8,041	2,161,801	80	19,378	32	3,292	2,413	615,409	1,508	402,648	26
17,261	3,851	1,152	467,755	1,151	467,335	1	420			523	142,258	428	117,835	27
1,242	960	206	55,864	206	55,864					44	5,667	44	5,667	28
42,187	13,460	8,052	1,965,797	7,891	1,935,829	116	24,129	45	5,839	3,401	505,868	2,138	321,396	29
10,517	8,507	777	263,369	768	261,869	3	800	6	700	103	32,786	96	30,536	30
2,403	890	442	211,041	440	210,481	2	560			112	49,060	71	24,500	31
164,119	336,677	20,296	4,963,841	19,861	4,914,124	216	24,974	219	24,743	7,132	1,365,234	3,230	633,384	32
36,097	24,266	9,972	1,994,177	9,901	1,986,984	17	1,438	54	5,755	3,321	657,282	1,925	371,909	33
300		138	25,810	138	25,810									34
107,465	138,625	14,413	4,112,992	13,996	4,058,240	82	12,304	335	42,448	1,357	390,041	1,070	297,957	35
160	100	35	6,570	35	6,570									36
59,323	96,978	6,457	2,492,170	6,432	2,487,652	21	3,568	4	950	2,680	831,499	1,386	451,048	37
195,137	210,586	39,978	10,328,271	39,680	10,281,962	114	20,896	184	25,393	21,315	4,862,148	7,162	2,013,783	38
925	145	245	85,138	244	84,738	1	400			59	23,030	39	14,580	39
6,721	4,283	4,100	713,206	4,100	713,206					1,055	286,073	1,148	194,952	40
2,311	425	548	157,115	545	156,675	3	440			186	58,855	168	53,415	41
75,234	64,706	9,614	2,506,615	9,470	2,489,492	22	2,756	122	14,367	1,466	312,000	752	163,703	42
109,548	73,576	11,064	4,142,814	11,024	4,136,484	9	1,788	31	4,542	4,244	1,569,893	2,033	739,298	43
4,046	835	324	88,747	323	88,732	1	15			96	26,991	62	16,885	44
77,793	17,589	10,434	2,356,180	10,324	2,338,995	53	9,175	57	8,010	4,053	656,333	2,212	351,502	45
35,538	54,161	9,153	1,942,052	8,728	1,893,616	337	38,026	88	10,410	3,173	580,414	1,529	274,134	46
130,594	120,506	10,207	5,102,340	10,171	5,094,543	25	5,782	11	2,015	2,570	1,042,109	1,223	578,164	47
36,643	27,448	6,163	1,623,879	6,110	1,617,131	10	2,018	43	4,730	1,855	459,625	1,213	307,654	48
768,264	441,997	63,361	15,184,987	62,847	15,102,143	332	64,035	142	18,809	30,606	5,138,574	18,877	3,265,897	49
1,190	775	118	44,318	116	43,768	1	250	1	300	5	2,240	3	1,700	50

TABLE 2.—DETAILED STATEMENT, LUMBER MILLS AND

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.											
		Logging—Continued.				Mill operations.							
		Employed in transportation of logs.		Employed by contractors.		Total.		Officers or firm members.				Clerks.	
								Males above 16 years.		Females above 15 years.		Males above 16 years.	
		Number.	Wages.	Estimated number.	Wages.	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States	34,909	$6,424,248	42,025	$9,647,464	286,197	$87,784,433	15,508	$7,934,060	64	$34,080	3,779	$2,674,213
2	Alabama	773	198,379	1,415	378,735	6,123	1,836,721	272	168,752	1	520	106	65,855
3	Alaska	4	407	.....	.....	88	22,173	6	3,000	.....	.....	2	548
4	Arizona	25	19,800	.....	.....	97	58,150	3	380	.....	.....	.....	.....
5	Arkansas	710	200,078	324	92,193	6,712	2,068,870	335	176,171	.....	.....	80	49,624
6	California	627	257,544	279	113,044	4,588	1,994,565	165	144,438	1	750	101	70,117
7	Colorado	91	39,481	10	4,105	904	323,413	49	30,433	.....	.....	6	2,145
8	Connecticut	42	16,818	56	16,488	754	269,788	101	55,282	1	600	.....	.....
9	Delaware	20	4,552	20	3,630	560	104,386	32	9,135	.....	.....	2	792
10	Florida	283	91,254	527	179,720	4,239	1,398,120	136	103,260	.....	.....	74	51,881
11	Georgia	930	243,658	241	61,841	5,917	1,572,284	243	110,848	.....	.....	73	39,255
12	Idaho	12	1,500	.....	.....	372	125,220	10	6,675	.....	.....	2	900
13	Illinois	198	38,797	305	61,821	4,314	1,147,784	237	90,721	1	1,100	42	28,778
14	Indiana	526	151,873	504	161,665	15,822	4,773,752	1,199	504,000	6	1,175	126	74,149
15	Indian territory	.....	.....	.....	.....	39	12,800	1	1,000	.....	.....	.....	.....
16	Iowa	12	1,680	261	58,862	7,011	2,153,582	138	123,631	3	3,950	146	115,983
17	Kansas	.....	.....	6	1,200	120	16,179	14	2,024	.....	.....	4	600
18	Kentucky	122	37,219	12	3,800	6,782	1,798,855	460	193,933	1	600	75	51,883
19	Louisiana	221	85,146	264	91,000	3,091	1,249,460	93	91,826	1	900	94	74,630
20	Maine	2,383	220,314	1,878	237,246	8,932	2,519,609	428	184,011	3	215	88	50,728
21	Maryland	72	15,738	39	7,257	1,078	389,747	129	45,909	.....	.....	15	9,750
22	Massachusetts	133	41,595	57	21,985	3,214	1,194,253	327	150,568	1	400	33	30,175
23	Michigan	3,775	606,544	8,975	2,079,885	46,592	14,677,436	1,730	1,233,291	14	7,480	676	494,065
24	Minnesota	2,097	260,511	3,045	560,874	10,783	3,383,765	297	249,154	.....	.....	205	170,781
25	Mississippi	656	172,652	952	250,069	4,434	1,287,391	230	111,545	.....	.....	79	46,162
26	Missouri	558	120,106	347	92,655	5,740	1,569,062	447	151,825	1	500	71	50,948
27	Montana	95	24,423	.....	.....	629	325,497	16	11,700	.....	.....	8	7,980
28	Nebraska	.....	.....	.....	.....	162	50,197	23	8,700	.....	.....	1	1,000
29	New Hampshire	852	122,752	411	61,720	4,651	1,459,929	289	105,786	.....	.....	55	34,988
30	New Jersey	.....	.....	7	2,250	674	230,583	43	26,170	.....	.....	11	7,438
31	New Mexico	33	21,760	8	2,800	330	161,981	14	10,256	.....	.....	.....	.....
32	New York	1,337	228,943	2,565	502,907	13,164	3,598,607	1,412	485,009	.....	.....	129	94,038
33	North Carolina	658	143,832	738	141,541	6,651	1,336,895	380	152,463	.....	.....	69	27,716
34	North Dakota	.....	.....	.....	.....	138	25,810	.....	.....	.....	.....	3	3,300
35	Ohio	267	86,223	20	5,861	13,056	3,722,951	1,415	541,383	2	400	94	76,034
36	Oklahoma	.....	.....	.....	.....	35	6,570	6	1,400	.....	.....	.....	.....
37	Oregon	556	140,141	738	240,310	3,777	1,660,671	223	141,341	3	870	75	53,855
38	Pennsylvania	7,753	1,054,647	6,400	1,793,718	18,663	5,466,123	706	394,960	7	3,210	197	153,841
39	Rhode Island	.....	.....	20	8,450	186	62,108	7	3,961	.....	.....	.....	.....
40	South Carolina	440	79,823	67	11,298	2,445	427,133	171	53,247	.....	.....	26	11,145
41	South Dakota	7	1,840	11	3,600	362	98,260	9	5,815	.....	.....	2	860
42	Tennessee	348	68,553	366	79,744	8,148	2,194,615	910	321,872	.....	.....	79	55,290
43	Texas	896	352,332	1,315	478,263	6,820	2,572,921	175	175,237	.....	.....	132	93,140
44	Utah	27	8,300	7	1,806	228	61,756	15	8,375	.....	.....	2	1,800
45	Vermont	718	126,194	1,123	178,547	6,381	1,609,847	599	217,020	.....	.....	27	17,160
46	Virginia	816	157,859	828	148,421	5,980	1,361,638	307	120,076	2	800	55	34,477
47	Washington	699	216,125	648	247,820	7,637	4,060,231	284	297,464	5	1,250	192	160,891
48	West Virginia	538	125,574	104	26,397	4,308	1,164,254	524	172,959	1	70	54	31,794
49	Wisconsin	4,597	638,741	7,132	1,233,936	32,755	10,046,413	890	734,179	10	9,290	465	326,317
50	Wyoming	2	540	.....	.....	113	42,078	8	2,875	.....	.....	3	1,400

SAW MILLS, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.														
Mill operations—Continued.													ANIMALS IN USE.		
Clerks—Continued.		Operatives, skilled and unskilled.						Pieceworkers.							
Females above 15 years.		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.			
Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Average number.	Cost of keep.	
117	$46,845	252,129	$73,723,635	1,388	$249,524	2,616	$333,604	9,051	$2,607,984	893	$113,875	652	$66,613	80,089	$6,112,170	1
2	1,200	5,469	1,557,227	4	520	164	23,797	102	18,550	1	250	2	50	4,069	264,574	2
		78	18,625													3
		94	57,770											160	18,920	4
		5,983	1,767,667	2	400	37	4,480	260	69,768	10	160	5	600	5,152	298,958	5
1	600	4,208	1,741,680	29	7,176	6	1,850	77	27,954					3,267	261,609	6
		816	272,790	7	1,135			26	16,910					559	64,421	7
		635	209,738					17	4,168					328	32,501	8
		336	79,609					120	12,300			70	2,550	132	7,708	9
5	1,650	3,591	1,213,981	24	4,400	60	6,758	346	15,990			3	200	1,485	122,685	10
1	1,300	5,374	1,388,025	29	4,000	98	7,648	94	20,758	2	250	3	200	2,988	256,994	11
		345	114,895	2	500	2	200	11	2,050					66	5,935	12
		3,893	1,003,104	7	510	66	7,173	63	15,648			5	750	505	29,133	13
6	1,694	15,227	3,816,730	146	34,445	258	36,831	717	285,886	93	13,752	44	5,090	1,620	118,856	14
		38	11,800											14	1,400	15
7	2,450	6,183	1,819,797	69	12,676	224	28,241	180	38,337	20	3,075	41	5,442	24	1,010	16
		100	13,355			2	200							10	452	17
		5,854	1,444,786	7	1,152	105	10,354	277	95,382			3	765	670	33,007	18
		2,773	1,028,709	2	832	14	2,650	79	39,006	35	10,907			636	39,949	19
7	3,734	7,928	2,156,377	67	13,119	51	6,277	321	100,502	30	4,204	9	442	2,013	111,773	20
		1,369	308,166	21	4,300	41	4,372	75	15,541	10	1,000	18	709	464	27,285	21
6	1,899	2,660	938,444	5	1,500	2	100	175	70,227	3	700	2	240	697	65,947	22
23	10,067	41,851	12,383,137	213	35,737	350	43,512	1,542	445,451	49	6,952	144	17,744	9,304	1,010,715	23
3	1,470	9,945	2,875,447	11	1,112	23	3,269	293	81,932	2	100	4	500	2,853	206,501	24
1	220	4,022	1,110,260	6	834	33	4,620	43	11,950	15	1,500	5	300	3,056	179,391	25
4	2,180	4,898	1,284,748	44	9,498	25	2,842	212	58,871	31	7,200	7	450	2,160	98,899	26
		579	295,397	1	420			25	10,000					205	25,357	27
		138	40,497											38	1,020	28
4	1,450	3,905	1,209,228	73	17,875	29	3,564	181	79,959	39	4,804	16	2,275	2,115	140,081	29
		569	184,273	2	600	2	344	42	11,202	1	200	4	356	76	8,015	30
		312	150,765	1	160			2	400	1	400			411	14,080	31
6	2,015	10,646	2,830,804	75	10,611	108	14,178	542	139,039	135	12,348	111	10,565	2,376	185,073	32
1	75	6,011	1,127,382	11	988	49	5,655	120	22,141	5	375	5	100	1,759	122,676	33
		135	22,510													34
7	2,118	10,556	2,883,524	38	4,121	260	35,967	574	167,258	35	5,665	75	6,481	1,115	84,762	35
		29	5,170													36
		3,429	1,454,847	18	2,698	2	200	25	6,110			2	750	1,839	125,309	37
9	3,350	16,918	4,731,222	68	9,819	139	18,847	544	139,811	30	4,517	45	6,546	4,056	404,241	38
1	400	171	56,343					7	1,404					36	3,750	39
		2,195	358,508					53	4,233					1,258	93,174	40
		338	89,345	3	440			10	1,800					233	11,206	41
1	600	6,764	1,732,339	18	1,816	110	12,629	251	67,991	3	340	12	1,738	1,582	92,013	42
1	250	6,315	2,269,353	8	1,538	31	4,542	158	28,861					3,891	256,802	43
		209	51,506	1	15			1	60					131	7,184	44
2	900	5,493	1,403,577	48	7,815	51	7,010	152	44,905	3	460	6	1,000	2,552	166,931	45
		4,933	1,122,530	35	5,726	80	9,750	260	36,119	300	31,500	8	660	2,028	149,340	46
1	500	7,032	3,533,700	16	3,617	10	1,940	93	60,379	3	415	1	75	1,235	145,536	47
4	1,440	3,593	932,016	5	508	43	4,730	84	20,737					981	78,027	48
14	5,283	30,034	8,586,254	271	46,661	140	18,774	892	316,819	37	2,801	2	35	9,936	744,820	49
		95	35,678	1	250	1	300	5	1,575					4	150	50

TABLE 2.—DETAILED STATEMENT, LUMBER MILLS AND

	STATES AND TERRITORIES.	MATERIALS USED.									
			In operations other than planing mill.								
			Obtained in woods.				Purchased at mill.				
				Standing timber.				Logs.		Bolts.	
		Aggregate cost.	Total cost.	Quantity. (Number of 1,000 feet, scaled measure.)	Cost. (Stumpage value.)	Logging supplies. (Cost.)	Total cost.	Quantity. (Number of 1,000 feet, board measure.)	Cost at mill.	Number of cords.	Cost at mill.
1	The United States	$186,451,654	$36,519,456	13,669,085	$34,417,861	$2,101,595	$109,331,382	13,087,846	$92,677,446	1,049,566	$4,228,721
2	Alabama	3,055,549	417,474	401,811	362,106	55,368	1,638,426	246,185	1,451,230	4,260	18,704
3	Alaska	29,636	5			5	17,904	3,146	16,185		
4	Arizona	61,395	14,500	9,500	9,500	5,000	16,695	1,360	12,675		
5	Arkansas	3,406,331	427,198	443,309	360,629	66,569	1,541,712	201,091	1,125,507	34,889	200,992
6	California	2,225,071	764,996	378,616	577,133	187,863	1,010,686	122,644	729,786	17,839	75,265
7	Colorado	366,597	49,607	38,322	43,832	5,775	231,448	40,499	211,511		
8	Connecticut	586,954	85,581	20,897	85,031	550	473,569	34,319	441,463	664	4,980
9	Delaware	161,238	25,120	12,820	23,720	1,400	107,598	12,838	96,325		
10	Florida	2,058,195	186,414	214,483	169,494	16,920	1,484,045	249,275	1,396,199	2,000	5,750
11	Georgia	2,077,578	376,741	385,582	311,987	64,754	1,304,581	232,501	1,149,225	1,430	5,720
12	Idaho	167,172	1,500	2,900	1,500		134,202	14,950	119,835	1,040	6,100
13	Illinois	2,665,673	243,271	76,151	240,844	2,427	1,699,202	161,124	1,557,663	12,538	35,804
14	Indiana	9,649,175	1,185,815	192,904	1,168,884	16,931	7,799,928	639,242	6,184,581	398,488	1,296,709
15	Indian territory	17,200	5,000	500	5,000		12,200	590	11,900		
16	Iowa	7,879,993	95,428	23,162	94,828	600	5,421,985	482,606	5,173,766	4,939	16,390
17	Kansas	35,761	5,200	850	5,200		30,561	3,327	27,901	150	1,000
18	Kentucky	3,908,199	140,800	84,799	134,709	6,091	3,519,003	397,793	2,962,204	43,109	232,152
19	Louisiana	2,683,260	107,445	89,840	81,345	26,100	2,117,605	277,619	2,036,911		
20	Maine	4,883,591	633,526	274,475	588,098	45,428	3,633,867	425,007	3,377,469	35,529	115,362
21	Maryland	712,054	106,452	39,165	104,969	1,483	451,922	54,483	400,085	2,173	30,950
22	Massachusetts	2,212,666	420,195	110,065	273,770	146,425	1,327,084	112,733	989,380	30,205	123,685
23	Michigan	36,882,853	13,603,705	3,198,213	13,050,868	552,837	19,765,947	2,264,709	15,315,360		
24	Minnesota	11,943,262	1,639,439	559,830	1,576,918	62,521	5,684,157	655,289	5,069,001		
25	Mississippi	1,820,301	317,084	323,305	304,596	12,488	787,079	143,275	658,435	7,750	27,840
26	Missouri	3,498,460	269,550	207,564	259,925	9,625	1,866,184	193,614	1,583,976	38,458	145,104
27	Montana	378,960	54,325	57,950	29,325	25,000	200,675	31,555	183,625		
28	Nebraska	56,865	2,270	1,470	2,270		54,595	8,474	49,651		
29	New Hampshire	1,825,889	367,892	176,737	345,977	21,915	1,150,939	130,242	868,957	27,934	149,200
30	New Jersey	651,736	25,762	6,217	25,162	600	468,856	36,428	430,001	756	4,511
31	New Mexico	109,181	24,500	15,600	24,300	200	80,206	10,760	77,929		
32	New York	7,166,499	834,105	432,615	818,282	15,823	4,928,711	548,961	4,367,089	69,256	244,050
33	North Carolina	2,227,225	303,490	270,827	283,495	19,995	1,536,834	288,505	1,329,928	15,390	68,822
34	North Dakota	36,045					36,045	6,819	35,780		
35	Ohio	7,117,995	327,966	105,048	323,461	4,505	5,844,538	584,255	4,922,680	189,913	606,784
36	Oklahoma	13,900					13,900	1,980	13,900		
37	Oregon	2,022,394	315,204	290,137	289,295	25,909	1,160,602	198,668	1,042,380	3,970	13,572
38	Pennsylvania	10,126,079	3,047,523	1,384,963	2,968,089	79,434	5,909,823	868,737	5,402,139	38,926	126,983
39	Rhode Island	85,986	10,110	3,840	10,110		66,141	5,311	63,185	310	1,700
40	South Carolina	595,535	124,612	121,095	111,352	13,260	446,668	96,875	398,594	700	6,650
41	South Dakota	110,696	21,398	11,050	20,798	600	61,923	11,800	56,348		
42	Tennessee	4,615,269	220,969	141,206	211,428	9,541	3,324,634	395,283	2,854,674	67,852	317,277
43	Texas	4,495,381	494,208	585,625	437,059	57,149	1,619,281	266,345	1,430,998	5,685	18,240
44	Utah	92,757	1,525	4,270	1,525		73,977	10,118	70,378		
45	Vermont	3,006,344	366,732	191,390	354,032	12,700	1,584,456	226,829	1,424,309	10,208	44,038
46	Virginia	2,176,204	251,879	206,774	236,730	15,149	1,529,267	232,201	1,256,923	24,650	121,553
47	Washington	6,742,798	345,989	330,710	266,560	79,429	5,223,477	825,957	4,732,124	35,700	110,794
48	West Virginia	2,430,859	315,883	138,685	296,875	19,008	1,625,446	189,550	1,490,437	12,855	52,040
49	Wisconsin	27,329,117	7,940,768	2,103,512	7,526,550	414,218	10,269,122	1,136,029	8,038,774		
50	Wyoming	49,776	300	300	300		43,676	6,005	38,070		

a Products of forest operations that did not become material for the mill.

SAW MILLS, BY STATES AND TERRITORIES: 1890—Continued.

MATERIALS USED—continued.						PRODUCTS.				
In operations other than planing mill—Continued.		Planing mills.					Forest products. (a)			
Purchased at mill—Cont'd.			Rough lumber.					Saw logs.		
Mill supplies. (Cost.)	All other materials. (Cost.)	Total cost.	Quantity. (Number of 1,000 feet, board measure.)	Cost at mill.	Mill supplies and all other materials. (Cost.)	Aggregate value.	Total value.	Quantity. (Number of 1,000 feet, board measure.)	Value.	
$4,815,331	$7,609,884	$40,600,816	3,382,696	$39,902,746	$698,070	$403,667,575	$14,364,158	1,445,049	$10,528,546	1
100,007	68,485	999,649	103,918	984,334	15,315	8,135,996	114,402	4,907	37,310	2
1,719		11,727	623	11,416	311	58,440	50	8	50	3
4,020		30,200	1,500	30,000	200	248,790	93,000	5,500	48,000	4
133,613	81,600	1,437,421	166,826	1,414,236	23,185	8,800,017	243,248	15,700	60,955	5
169,410	36,225	449,389	32,822	432,376	17,013	8,453,964	545,232	65,360	361,301	6
17,963	1,974	85,542	5,493	83,492	2,050	1,172,190	23,860	1,340	8,320	7
10,962	16,164	27,804	1,355	27,400	404	1,236,736	123,127	22	340	8
4,200	7,073	28,520	3,250	28,100	420	397,057	17,720	1,550	6,900	9
61,381	20,715	387,736	38,647	378,568	9,168	5,424,307	130,113	24,273	121,458	10
123,561	26,075	396,256	48,461	389,892	6,364	6,306,095	89,510	13,414	61,877	11
6,842	1,425	31,470	2,340	31,170	300	429,990	6,050	800	5,300	12
50,661	55,074	723,200	41,795	715,650	7,570	5,090,940	25,965	542	5,684	13
186,320	132,318	663,432	35,385	632,729	30,703	19,964,293	187,517	7,360	87,030	14
300						41,950				15
120,388	111,441	2,362,580	169,253	2,343,484	19,096	11,829,065	159,628	18,112	150,000	16
1,364	296					85,521	11,325	150	5,700	17
103,919	220,728	248,396	23,794	239,416	8,980	7,869,082	325,050	30,703	314,630	18
63,992	16,702	458,210	35,866	441,560	16,650	5,599,744	103,351	12,000	60,000	19
104,470	36,566	616,198	54,773	607,178	9,020	10,907,438	146,562	17,650	119,855	20
16,277	4,610	153,680	11,849	152,060	1,620	1,595,282	42,844	985	8,780	21
56,688	157,331	465,387	40,429	453,016	12,371	5,109,998	133,015	4,770	45,574	22
933,907	3,516,680	3,513,201	257,759	3,463,385	49,816	73,484,306	5,364,362	613,668	4,761,836	23
200,092	415,064	4,619,666	374,389	4,582,062	37,604	21,013,010	1,347,807	147,768	1,213,689	24
75,944	24,860	716,138	69,874	692,728	23,410	5,670,774	34,604	4,069	16,498	25
97,593	39,511	1,362,726	115,144	1,339,491	23,235	7,487,844	56,098	3,145	16,423	26
16,940	110	123,960	8,193	123,345	615	1,178,380	4,300	1,050	4,300	27
4,534	410					154,945	5,497	500	3,903	28
59,882	72,900	307,058	28,183	299,800	7,258	5,017,062	33,650	1,317	9,580	29
10,736	23,608	157,118	7,341	156,290	828	1,215,524	42,725	1,000	12,000	30
2,217	60	4,475	525	4,250	225	389,761	11,200			31
155,574	161,998	1,403,683	116,150	1,370,688	32,995	16,457,811	266,049	2,696	17,246	32
86,944	51,140	386,901	42,385	383,010	3,891	5,767,687	158,194	30,437	140,549	33
265						76,173				34
157,060	158,014	945,491	53,306	924,594	20,897	15,161,730	178,051	3,784	26,771	35
						27,260				36
82,814	21,836	546,588	52,760	532,736	13,852	5,994,915	288,570	24,261	105,263	37
315,455	65,246	1,168,739	100,616	1,135,245	33,488	27,772,834	1,131,151	46,015	259,255	38
1,131	125	9,735	620	9,400	335	244,490	32,440			39
26,612	14,812	24,255	2,330	23,390	865	1,982,583	43,459	3,713	12,919	40
5,255	320	27,375	2,508	26,825	550	375,769	25,000	1,400	9,600	41
119,402	33,281	1,069,666	75,733	1,048,123	21,543	8,941,995	61,886	4,128	28,617	42
128,782	41,261	2,381,892	268,085	2,333,382	48,510	11,328,257	103,899	11,604	52,200	43
3,364	235	17,255	900	15,600	1,655	234,820	2,330			44
83,016	33,093	1,055,156	101,882	1,033,227	21,929	6,843,817	33,020	1,866	16,695	45
68,365	82,426	395,058	33,739	388,784	6,274	5,541,825	40,498	4,585	19,502	46
250,421	130,138	1,173,332	99,265	1,137,287	36,045	15,067,627	151,573	19,745	109,770	47
47,879	35,090	489,530	38,561	482,505	7,025	5,239,340	64,869	3,585	27,024	48
539,359	1,690,989	9,119,227	713,694	8,995,042	124,185	52,115,739	2,361,357	289,617	2,155,845	49
3,731	1,875	5,800	375	5,500	300	124,462				50

TABLE 2.—DETAILED STATEMENT, LUMBER MILLS AND

	STATES AND TERRITORIES.	PRODUCTS—continued.							
		Mill products other than planing mill—Continued.							
		Reported in feet, board measure—Continued.						Shingles.	
		Furniture stock.		Pickets.		Sawed lumber.			
		Quantity. (Number of 1,000 feet.)	Value.	Quantity. (Number of 1,000 feet.)	Value.	Quantity. (Number of 1,000 feet.)	Value.	Number of 1,000.	Value.
1	The United States	94,344	$1,432,860	107,362	$754,938	23,497,653	$267,256,681	9,275,809	$17,030,481
2	Alabama	261	3,317	1,380	16,078	586,143	5,416,187	292,583	574,965
3	Alaska			16	240	2,800	38,887	70	260
4	Arizona			20	540	5,300	105,750	1,500	4,500
5	Arkansas	223	5,110	1,875	13,548	526,091	4,873,423	329,823	707,568
6	California	50	1,500	1,858	18,628	515,823	6,515,942	305,964	423,987
7	Colorado			45	1,100	79,906	938,760	10,625	28,000
8	Connecticut	140	2,200	11	175	48,277	898,947	3,523	10,034
9	Delaware			8	125	23,152	261,567	100	250
10	Florida	10	300	308	3,415	411,436	4,200 659	114,107	279,199
11	Georgia	458	5,515	837	8,895	572,970	5,059,619	102,877	188,178
12	Idaho					27,800	313,550	7,825	22,190
13	Illinois	86	1,715	508	7,216	218,938	3,246,236	18,339	45,309
14	Indiana	14,415	238,374	9,273	63,357	707,115	11,779,147	78,789	138,000
15	Indian territory					522	16,660		
16	Iowa	359	6,225	1,142	42,303	568,816	7,764,546	209,649	408,667
17	Kansas					4,037	65,506		
18	Kentucky	215	6,593	443	4,552	420,820	5,486,064	36,748	62,070
19	Louisiana			130	2,000	303,591	3,844,229	411,725	878,418
20	Maine	1,265	22,362	6,207	65,737	564,243	6,516,541	483,153	932,679
21	Maryland	62	1,690	577	6,470	81,078	976,052	12,277	29,802
22	Massachusetts	2,139	33,599	87	1,875	208,655	2,932,212	24,523	57,186
23	Michigan	20,225	276,349	14,460	72,086	4,245,717	49,811,382	2,848,820	5,173,445
24	Minnesota	973	12,651	2,743	10,228	1,079,403	12,387,184	461,472	787,644
25	Mississippi	513	5,196	322	3,410	452,797	4,378,022	11,270	24,310
26	Missouri	1,422	27,039	688	7,452	395,755	4,594,596	24,089	47,298
27	Montana					89,511	958,570	1,295	4,300
28	Nebraska			5	50	8,556	96,844	2,805	5,070
29	New Hampshire	1,885	40,824	438	4,380	266,890	2,869,035	79,193	131,614
30	New Jersey	100	2,000	606	5,814	32,285	632,565	17,608	54,942
31	New Mexico					26,112	293,257	3,140	7,004
32	New York	6,270	83,745	2,812	11,644	909,990	10,718,916	491,641	606,006
33	North Carolina	227	3,255	272	4,653	509,436	4,335,331	100,442	277,632
34	North Dakota			1	15	6,819	70,440	2,000	2,000
35	Ohio	10,351	175,891	4,636	35,822	541,076	7,961,938	49,302	117,177
36	Oklahoma					2,030	26,660		
37	Oregon	1,138	25,460	758	8,225	444,565	4,606,025	51,530	109,445
38	Pennsylvania	2,219	25,760	15,275	126,677	2,113,267	21,646,261	422,701	784,856
39	Rhode Island			1	20	7,620	128,795	3,790	9,250
40	South Carolina	188	2,974	277	2,975	197,940	1,681,037	23,618	80,394
41	South Dakota					21,412	258,969	7,845	18,640
42	Tennessee	6,644	108,418	871	7,767	450,097	5,678,762	19,537	44,017
43	Texas	304	3,550	2,422	14,606	839,724	7,589,149	214,082	504,031
44	Utah			25	475	14,295	187,485	1,115	3,330
45	Vermont	10,075	165,660	180	5,100	370,155	3,967,678	69,035	136,035
46	Virginia	122	2,840	703	4,656	409,804	3,884,909	11,566	51,162
47	Washington	125	1,850	1,898	18,006	1,061,560	11,268,829	545,297	1,064,138
48	West Virginia	840	10,922	356	3,793	299,709	3,938,223	1,009	3,176
49	Wisconsin	11,040	129,976	32,886	150,818	2,817,200	31,936,715	1,366,022	2,186,643
50	Wyoming			2	22	6,415	98,620	1,385	5,660

a Items included in this column are shown in statement on page 600.

SAW MILLS, BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.									
Mill products other than planing mill—Continued.									
Staves.		Heading.		Lath.		Tolls received for custom sawing.	All other products. (Value.) (a)	Planing mill products. (Value.)	
Pieces.	Value.	Sets.	Value.	Number of 1,000.	Value.				
1,178,551,745	$7,762,344	182,742,837	$4,933,799	2,263,308	$3,519,924	$9,589,580	$20,980,752	$53,465,797	1
2,100,000	26,700	50,000	2,000	35,105	40,370	107,788	485,370	1,314,481	2
						69		18,944	3
								45,000	4
49,101,550	631,638	3,917,848	88,074	20,364	24,437	64,710	153,654	1,807,721	5
		175,000	2,975	7,350	15,300	32,320	260,323	637,007	6
				4,500	13,000	8,470		159,000	7
40,000	150	26,800	941	1,500	3,000	32,605	105,642	45,500	8
2,500,000	7,000	100,000	1,000	650	1,625	8,791	55,079	37,280	9
690,073	4,260	7,071	137	35,000	45,500	29,105	195,490	533,429	10
16,767,900	68,022	278,500	4,861	23,250	24,645	142,478	101,440	598,679	11
				1,000	3,000	9,400	3,000	72,800	12
34,176,400	219,278	2,533,000	68,165	30,000	66,000	25,978	503,905	831,305	13
101,468,600	1,035,319	51,062,560	2,138,893	23,300	48,930	413,855	2,238,957	1,077,362	14
						25,290			15
1,112,000	6,470	616,000	18,480	110,500	209,950	111,528	382,496	2,697,447	16
						1,340	7,350		17
28,308,032	201,037	8,348,234	100,337	35,808	57,293	149,835	1,059,919	390,425	18
183,500	1,006	221,140	9,951	7,500	9,000	6,932	55,945	688,837	19
82,880,100	391,039	8,553,516	211,828	190,355	304,568	183,009	889,081	840,744	20
930,000	6,362			3,500	7,700	50,755	252,867	210,625	21
8,039,200	39,899	1,431,982	18,838	20,365	36,657	118,852	983,859	736,563	22
250,401,389	1,420,990	32,057,025	662,910	478,935	751,928	3,534,557	1,840,558	4,338,645	23
6,300,000	10,600	450,000	16,000	176,300	248,583	676,531	106,976	5,386,173	24
8,800,000	46,900	130,000	4,200	10,355	18,639	16,594	141,850	986,960	25
23,761,000	157,390	2,245,000	28,050	26,785	53,600	107,310	690,875	1,631,550	26
				3,360	11,750	12,310		187,150	27
						12,484	35,000		28
50,501,800	136,207	2,794,000	80,197	55,834	83,750	90,129	1,023,678	425,138	29
		25,000	750	9,150	21,900	16,206	176,044	253,308	30
				2,310	6,930	58,370		13,000	31
26,592,004	153,602	18,581,103	283,946	85,250	115,087	447,209	1,521,252	2,149,678	32
159,500	804	11,000	238	19,330	36,565	88,212	257,220	539,293	33
				1,600	3,200	500			34
267,783,850	1,307,084	20,955,967	541,989	38,265	99,489	244,582	2,720,788	1,581,543	35
						600			36
5,052,000	20,700	784,000	16,520	14,110	29,130	48,410	38,775	802,807	37
51,463,800	329,549	5,883,915	84,194	195,273	234,328	920,031	689,867	1,743,595	38
384,000	1,200					7,345	8,700	56,500	39
4,520,000	18,875	239,800	5,611	19,150	26,810	5,418	65,552	44,075	40
				1,080	2,562	10,788		59,750	41
60,490,000	589,200	8,675,783	151,509	35,350	56,560	109,265	526,992	1,564,400	42
				39,565	41,580	77,034	25,030	2,965,723	43
						6,350		34,850	44
7,286,600	59,850	385,900	4,942	23,475	32,865	136,052	825,471	1,414,697	45
15,230,500	76,874	1,571,000	36,670	19,204	30,432	141,287	581,315	587,514	46
168,389	1,362	71,160	3,427	49,600	112,020	289,318	275,679	1,881,400	47
27,997,536	385,751	418,778	12,926	23,480	39,916	50,731	84,992	628,160	48
63,362,022	407,226	10,141,755	333,240	385,500	551,265	947,627	1,609,761	11,437,739	49
						11,160		9,000	50

TABLE 3.—CLASSIFICATION OF EMPLOYÉS, AVERAGE TERM OF EMPLOYMENT, AND AVERAGE

[Pieceworkers and the 42,025 employés shown in Table 2, reported as the

	STATES AND TERRITORIES.	Number of establishments reporting.	OFFICERS OR FIRM MEMBERS ACTIVELY ENGAGED IN THE INDUSTRY OR IN SUPERVISION.						CLERKS.						OPERATIVES, SKILLED AND UNSKILLED.		
			Males above 16 years.			Females above 15 years.			Males above 16 years.			Females above 15 years.			Males above 16 years engaged in—		
															Woods.		
			Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.
1	Alabama	437	272	8.00	$77.52	1	10.00	$52.00	106	10.34	$60.09	2	11.50	$52.17	2,182	9.21	$29.06
2	Alaska	10	6	5.17	96.77				2	4.50	60.87				1	4.00	38.75
3	Arizona	4	3	2.00	63.33										42	10.00	63.45
4	Arkansas	523	335	7.30	72.05				80	9.39	66.08				2,762	8.23	34.57
5	California	221	165	6.86	127.60	1	7.00	107.14	101	8.21	84.58	1	12.00	50.00	3,698	8.60	47.14
6	Colorado	109	49	6.51	95.40				6	5.50	65.00				337	7.64	52.44
7	Connecticut	157	101	7.49	73.12	1	12.00	50.00							304	8.60	34.13
8	Delaware	47	32	5.41	52.80				2	7.50	52.80				88	6.33	28.67
9	Florida	202	136	8.53	89.02				74	9.97	70.30	5	6.20	53.23	826	9.94	34.28
10	Georgia	434	243	7.71	59.15				73	10.16	52.90	1	10.00	130.00	2,425	9.55	26.91
11	Idaho	41	10	6.60	101.14				2	8.50	52.94				38	4.55	72.20
12	Illinois	357	237	6.04	63.40	1	11.00	100.00	42	7.74	88.55				485	6.25	32.40
13	Indiana	1,603	1,199	7.03	59.79	6	8.00	24.48	126	10.29	57.21	6	10.17	27.77	1,519	9.36	34.24
14	Indian territory	3	1	10.00	100.00										12	10.00	44.17
15	Iowa	137	138	6.96	128.65	3	8.00	164.58	146	8.80	90.26	7	7.71	45.37	19	6.63	34.02
16	Kansas	27	14	4.00	36.14				4	3.00	50.00				29	5.28	38.46
17	Kentucky	595	460	6.30	66.90	1	12.00	50.00	75	9.84	70.30				1,260	9.23	33.42
18	Louisiana	122	93	9.23	107.02	1	10.00	90.00	94	10.96	72.46				505	8.62	39.92
19	Maine	831	428	7.07	60.83	3	2.00	35.83	88	9.25	62.32	7	9.86	54.11	3,941	4.16	30.36
20	Maryland	212	129	7.00	50.84				15	10.80	60.19				421	6.65	27.84
21	Massachusetts	464	327	7.51	61.31	1	12.00	33.33	33	11.39	80.25	6	9.50	33.32	885	9.26	41.59
22	Michigan	1,918	1,730	5.83	122.34	14	8.43	63.39	676	7.69	95.07	23	9.51	46.02	21,685	6.04	38.34
23	Minnesota	317	297	5.25	159.92				205	6.77	123.13	3	6.67	73.50	3,799	4.83	38.16
24	Mississippi	338	230	7.38	65.69				79	9.71	60.19	1	10.00	22.00	1,638	9.31	28.19
25	Missouri	748	447	5.40	62.89	1	12.00	41.67	71	9.73	73.73	4	10.75	50.70	1,508	7.58	35.22
26	Montana	30	16	8.38	87.31				8	7.13	140.00				428	6.02	45.76
27	Nebraska	31	23	7.17	52.73				1	12.00	83.33				44	5.23	24.64
28	New Hampshire	531	289	6.43	56.94				55	10.22	62.26	4	10.25	35.37	2,138	5.19	28.95
29	New Jersey	110	43	9.37	64.94				11	11.27	59.98				96	10.75	29.59
30	New Mexico	26	14	8.57	85.47										71	7.82	44.14
31	New York	1,664	1,412	5.89	58.32				129	9.05	80.58	6	11.00	30.53	3,230	5.95	32.94
32	North Carolina	688	380	7.48	53.63				69	9.19	43.72	1	3.00	25.00	1,925	9.63	20.06
33	North Dakota	5							3	4.00	275.00						
34	Ohio	1,427	1,415	6.16	62.15	2	6.50	30.77	94	9.57	84.48	7	9.29	32.58	1,070	8.62	32.30
35	Oklahoma	8	6	5.33	43.75												
36	Oregon	300	223	6.98	90.78	3	9.67	30.00	75	9.32	77.05				1,386	7.03	46.26
37	Pennsylvania	1,853	706	6.58	84.99	7	19.00	45.86	197	9.21	84.76	9	9.89	37.64	7,162	7.35	38.28
38	Rhode Island	29	7	9.14	61.89							1	12.00	33.33	39	9.42	39.67
39	South Carolina	328	171	6.72	46.34				26	10.54	40.68				1,148	8.68	19.56
40	South Dakota	41	9	7.11	90.86				2	12.00	35.83				168	8.58	37.04
41	Tennessee	787	910	6.12	57.84				79	9.47	73.92	1	12.00	50.00	752	7.72	28.21
42	Texas	284	175	8.19	122.29				132	10.16	69.46	1	5.00	50.00	2,033	9.30	39.11
43	Utah	30	15	4.40	126.89				2	9.00	100.00				62	6.37	42.75
44	Vermont	736	599	7.07	51.26				27	9.37	67.83	2	10.00	45.00	2,212	5.02	31.64
45	Virginia	638	307	7.12	54.90	2	11.50	34.78	55	10.65	58.83				1,529	7.77	23.08
46	Washington	310	284	8.40	124.67	5	7.40	33.78	192	9.62	87.11	1	8.00	62.50	1,223	8.27	57.14
47	West Virginia	428	524	6.25	52.84	1	2.00	35.00	54	9.81	59.99	4	12.00	30.00	1,213	8.10	31.31
48	Wisconsin	853	890	6.01	137.36	10	6.50	142.92	465	7.53	93.15	14	7.93	47.59	18,877	4.95	34.98
49	Wyoming	17	8	4.13	87.12				3	11.33	41.18				3	11.67	48.57

MONTHLY EARNINGS, LUMBER MILLS AND SAW MILLS, BY STATES AND TERRITORIES: 1890.

estimated number employed by contractors, are not included in this table.]

OPERATIVES, SKILLED AND UNSKILLED—continued.

Males above 16 years engaged in—(Continued)									Females above 15 years engaged in—						Children engaged in—						
Transportation.			Mill operations other than planing mill.			Planing mill.			Mill operations other than planing mill.			Planing mill.			Mill operations other than planing mill.			Planing mill.			
Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.	
773	8.32	$30.83	4,950	9.05	$30.66	519	9.93	$35.68	4	10.50	$12.38	.....	.....	.....	125	10.71	$15.37	39	8.18	$10.06	1
4	1.50	67.83	68	4.19	59.01	10	2.40	75.33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
25	10.00	79.20	87	9.97	61.21	7	11.00	61.04	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
710	8.35	33.73	5,352	8.26	35.36	631	9.89	32.81	1	7.00	14.29	1	12.00	$25.00	37	8.22	14.74	.....	.....	.....	4
627	8.02	51.23	3,933	8.09	51.49	275	7.69	49.30	28	7.11	35.31	1	7.00	21.43	6	11.17	27.61	.....	.....	.....	5
91	7.98	54.38	760	5.86	52.64	56	9.64	71.03	7	4.57	35.47	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
42	10.36	38.66	601	8.38	39.38	34	10.32	32.58	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7
20	8.30	27.42	315	7.54	31.97	21	5.71	31.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
283	9.65	33.41	3,316	10.04	33.72	275	9.42	35.33	24	12.00	15.28	.....	.....	.....	60	10.67	10.56	.....	.....	.....	9
930	9.87	26.55	5,027	9.15	28.00	347	10.63	27.30	24	9.50	11.50	5	10.00	27.56	92	9.04	8.38	6	7.83	14.32	10
12	2.00	62.50	317	6.03	52.81	28	7.61	65.82	2	8.00	31.25	.....	.....	.....	2	4.00	25.00	.....	.....	.....	11
198	6.14	31.93	3,743	7.21	34.88	150	10.87	37.63	7	5.57	13.08	.....	.....	.....	66	7.53	14.43	.....	.....	.....	12
526	8.10	35.64	12,345	8.55	33.36	882	10.16	33.20	129	11.26	19.03	17	12.00	33.33	256	9.85	14.48	2	12.00	13.00	13
.....	.....	.....	38	6.97	44.53	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
12	4.50	31.11	5,851	8.34	34.93	332	10.38	33.26	69	8.93	20.58	.....	.....	.....	219	8.14	15.34	5	10.60	17.21	15
.....	.....	.....	100	4.11	32.49	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	7.00	14.29	.....	.....	.....	16
122	8.53	35.75	5,624	7.95	31.05	230	6.92	35.36	7	11.14	14.77	.....	.....	.....	105	9.12	10.81	.....	.....	.....	17
221	9.20	41.86	2,508	9.59	38.53	265	11.14	41.13	.....	.....	.....	2	12.00	34.67	14	11.50	16.46	.....	.....	.....	18
2,383	2.66	34.78	7,596	7.73	34.71	332	8.46	42.38	67	9.31	21.02	.....	.....	.....	48	7.70	16.03	3	10.33	17.74	19
72	7.60	28.77	1,254	7.86	28.06	115	8.11	33.98	21	7.24	28.29	.....	.....	.....	31	7.00	15.54	10	10.00	10.00	20
133	8.44	37.04	2,326	8.93	38.80	334	9.45	41.93	5	12.00	25.00	.....	.....	.....	2	5.00	10.00	.....	.....	.....	21
3,775	3.36	47.80	40,687	7.20	40.83	1,164	8.89	40.29	213	7.75	21.65	.....	.....	.....	324	7.55	16.13	26	11.38	13.77	22
2,097	2.29	54.14	9,314	6.38	43.57	631	9.73	46.39	11	3.36	30.05	.....	.....	.....	21	6.48	21.24	2	11.00	17.32	23
656	8.80	29.91	3,630	8.98	29.49	392	9.96	38.29	6	8.67	16.04	.....	.....	.....	29	9.52	14.57	4	10.00	15.00	24
558	6.61	32.57	4,572	7.00	36.19	326	9.87	39.43	44	11.07	19.50	.....	.....	.....	24	9.04	12.38	1	11.00	14.18	25
95	3.49	73.57	525	8.37	60.60	54	10.43	51.69	1	10.00	42.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	26
.....	.....	.....	138	6.84	42.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27
852	3.44	41.89	3,726	8.27	36.67	239	8.34	39.82	73	10.64	23.01	.....	.....	.....	29	9.45	13.01	.....	.....	.....	28
.....	.....	.....	517	9.61	32.80	52	10.42	39.37	2	11.00	27.27	.....	.....	.....	2	11.50	14.97	.....	.....	.....	29
33	10.33	63.82	304	8.40	57.70	8	9.75	43.59	1	8.00	20.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	30
1,337	4.95	34.59	9,464	7.40	35.37	1,182	8.07	37.10	75	8.33	16.98	.....	.....	.....	100	8.70	14.97	8	8.75	16.43	31
658	9.37	23.32	5,696	8.45	22.03	315	8.15	25.90	11	7.82	11.49	.....	.....	.....	45	9.58	12.19	4	11.00	9.09	32
.....	.....	.....	135	3.83	43.54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33
267	8.75	36.89	9,796	8.01	33.78	760	7.61	40.41	38	7.82	13.87	.....	.....	.....	253	9.32	14.80	7	11.71	13.17	34
.....	.....	.....	29	5.62	31.72	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35
556	6.34	39.77	3,035	8.35	51.26	394	7.86	50.14	15	8.33	19.18	3	9.00	11.11	2	12.00	8.33	.....	.....	.....	36
7,753	3.22	42.26	16,183	7.12	38.89	735	8.57	40.05	68	7.31	19.76	.....	.....	.....	111	7.82	15.22	28	12.00	16.79	37
.....	.....	.....	104	7.89	37.51	67	11.91	32.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	38
440	8.87	20.45	2,150	7.57	21.69	45	5.42	23.16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39
7	6.71	39.15	288	6.27	40.08	50	8.36	40.67	3	4.67	31.43	.....	.....	.....	.....	.....	.....	.....	.....	.....	40
348	6.93	28.43	6,010	8.06	30.24	754	10.10	35.12	18	9.28	10.87	.....	.....	.....	72	7.57	12.16	38	11.74	13.45	41
896	9.23	42.61	5,288	9.31	37.39	1,027	10.65	39.18	8	8.63	22.29	.....	.....	.....	29	8.03	18.31	2	11.00	12.50	42
27	7.56	40.67	184	4.57	49.33	25	7.72	52.18	1	1.00	15.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	43
718	5.34	32.93	4,776	8.23	31.09	717	8.00	31.72	48	11.04	14.75	.....	.....	.....	51	10.37	13.25	.....	.....	.....	44
816	8.04	24.06	4,660	8.47	26.51	273	9.08	30.82	33	9.21	16.20	2	8.00	50.00	80	10.99	11.09	.....	.....	.....	45
699	5.26	51.85	6,453	9.03	55.09	579	9.64	58.14	16	6.38	35.46	.....	.....	.....	10	7.90	24.56	.....	.....	.....	46
538	7.38	31.64	3,279	8.15	30.89	314	9.03	37.63	5	7.00	14.51	.....	.....	.....	33	9.27	12.19	10	8.00	12.50	47
4,597	2.60	53.46	26,756	7.16	38.26	3,278	9.47	40.45	247	7.47	21.57	24	9.50	30.04	90	8.38	12.28	50	11.16	17.06	48
2	6.00	45.00	89	7.84	49.40	6	4.00	50.00	1	9.00	27.78	.....	.....	.....	1	12.00	25.00	.....	.....	.....	49

TABLE 4.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT MONTHLY RATES OF

[The 42,025 employés shown in Table 2, reported as the estimated

	STATES AND TERRITORIES.	Number of establishments reporting.	MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a)									
			Males above 16 years engaged in—									
			Woods.									
			Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $18.	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.
1	The United States	21,011	97,218	137	114	683	1,413	1,311	8,400	14,855	21,888	23,542
2	Alabama	437	2,182		1	7	33	62	638	747	365	178
3	Alaska	10	1									1
4	Arizona	4	42									
5	Arkansas	523	2,762	12	6	16	38	60	351	514	750	504
6	California	221	3,698	24	2	120	1	11	121	188	200	623
7	Colorado	109	337							10	18	26
8	Connecticut	157	304					3	20	57	94	94
9	Delaware	47	88				6		19	36	11	12
10	Florida	202	826						119	277	128	146
11	Georgia	434	2,425	8	12	27	129	123	780	809	358	52
12	Idaho	41	38									
13	Illinois	357	485				2		38	192	151	59
14	Indiana	1,603	1,519				10	22	101	386	455	271
15	Indian territory	3	12									
16	Iowa	137	19							8	5	5
17	Kansas	27	29							10	12	
18	Kentucky	595	1,260		12		13	28	60	122	783	160
19	Louisiana	122	505		4		11	6	14	69	125	13
20	Maine	831	3,941			38	41	8	420	1,043	1,650	529
21	Maryland	212	421				6	1	53	177	124	46
22	Massachusetts	464	885		3		23	30	55	102	163	142
23	Michigan	1,918	21,685			3		27	322	822	3,623	10,321
24	Minnesota	317	3,799						55	534	838	1,007
25	Mississippi	338	1,638	2	7	7	40	55	440	592	302	100
26	Missouri	748	1,508		3	12	13	5	39	466	527	257
27	Montana	30	428								71	13
28	Nebraska	31	44				6		3	26	3	3
29	New Hampshire	531	2,138	12		4		6	564	344	536	401
30	New Jersey	110	96						6	57	10	12
31	New Mexico	26	71								4	20
32	New York	1,664	3,230		1	3	29		233	735	1,149	608
33	North Carolina	688	1,925	33	30	200	546	309	485	199	78	8
34	North Dakota	5										
35	Ohio	1,427	1,070	7			3	9	149	218	310	228
36	Oklahoma	8										
37	Oregon	300	1,386	2		5	27	13	57	53	92	193
38	Pennsylvania	1,853	7,162				2	2	77	222	2,219	2,806
39	Rhode Island	29	39								15	6
40	South Carolina	328	1,148	17	15	184	239	251	270	81	65	3
41	South Dakota	41	168				20		5	11	41	29
42	Tennessee	787	752			9	5	26	170	276	148	79
43	Texas	284	2,033		5	3	15	32	136	175	447	400
44	Utah	30	62							3	27	
45	Vermont	736	2,212				6		257	701	881	242
46	Virginia	638	1,529	19	13	45	127	85	642	525	38	15
47	Washington	310	1,223					1		1	2	85
48	West Virginia	428	1,213	1			2	8	67	398	554	100
49	Wisconsin	853	18,877				20	128	1,634	3,649	4,507	3,745
50	Wyoming	17	3									

a In comparing the monthly rates of wages and number of employés at each rate with the average monthly earnings, it must be remembered that it is impracticable to obtain true average monthly earnings from the table of monthly rates, because the term of employment varies for employés reported at the respective rates.

PAY, LUMBER MILLS AND SAW MILLS, BY STATES AND TERRITORIES: 1890.

number employed by contractors, are not included in this table.]

MONTHLY RATE OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Males above 16 years engaged in—(Continued)													
Woods—Continued.		Transportation.											
$40 and over but under $50.	$50 and over.	Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $18.	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.	$40 and over but under $50.	$50 and over.	
17,121	7,754	34,900	5	31	86	423	573	1,813	3,130	5,059	4,114	8,738	10,937	1
104	47	773			1	8	9	158	293	187	40	38	39	2
		4											4	3
	42	25											25	4
243	268	710		4	4	28		71	135	211	113	125	19	5
772	1,636	627					106	7	18	25	21	91	359	6
115	168	91						2	4	4	2	21	58	7
26	10	42						4		9	13	10	6	8
2	2	20						4	10	4	2			9
120	36	283						15	108	91	17	3	49	10
41	86	930		8	5	35	45	309	398	102	17	4	7	11
5	33	12											12	12
38	5	198						10	81	49	58			13
170	104	526				2		9	75	213	119	91	17	14
12														15
	1	12							8	4				16
5	2													17
63	19	122					3	12	39	19	7	32	10	18
180	63	221						26	30	25	14	65	61	19
150	53	2,383				100	2	5	312	703	287	399	575	20
9	5	72					3	14	20	21	8	6		21
177	190	133							4	55	32	31	11	22
5,130	1,437	3,775						8	18	41	311	2,131	1,266	23
1,094	271	2,097						2	55	10	67	851	1,112	24
41	52	656			4	2	3	165	186	161	74	42	19	25
96	90	558				6	3	49	137	224	87	44	8	26
212	132	95								2		2	91	27
1	2													28
208	63	852						3	60	304	117	347	21	29
10	1													30
26	21	33											33	31
322	150	1,337					4	116	110	340	361	239	167	32
18	19	658	4	15	40	144	97	165	122	15	10	22	24	33
														34
67	79	267				2		2	41	38	83	64	37	35
														36
437	507	556			5		38	19	46	76	60	119	193	37
1,669	165	7,753						7	64	971	1,293	2,593	2,825	38
14	4													39
13	10	440		4	15	26	117	210	46	22				40
28	34	7							4			1	2	41
18	21	348			3	6	5	66	157	66	34	8	3	42
537	283	896				3		10	52	125	88	377	241	43
11	21	27										25	2	44
66	59	718					45	9	59	442	124	24	15	45
12	8	816	1		9	45	93	314	210	132	12			46
369	765	699									4	196	499	47
35	48	538						20	183	189	96	40	10	48
4,453	741	4,597				16		2	45	179	543	695	3,117	49
2	1	2										2		50

TABLE 4.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT MONTHLY RATES OF

	STATES AND TERRITORIES.	MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.									
		Males above 16 years engaged in—(Continued)									
		Mill operations other than planing mill.									
		Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $18.	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.
1	The United States	253,186	351	360	1,351	4,285	4,531	18,697	40,255	51,753	45,585
2	Alabama	5,328	.....	.....	4	84	117	1,014	1,829	1,158	372
3	Alaska	76	.....	.....	.....	.....	.....	.....	3	.....	2
4	Arizona	90	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	Arkansas	5,767	18	7	51	116	170	480	1,175	1,458	813
6	California	4,199	.....	.....	.....	.....	1	2	27	471	490
7	Colorado	815	.....	.....	.....	.....	1	5	38	75	89
8	Connecticut	702	.....	.....	.....	1	.....	27	50	110	229
9	Delaware	349	.....	.....	4	21	14	32	61	90	40
10	Florida	3,526	.....	1	6	21	23	466	1,055	644	510
11	Georgia	5,343	6	15	120	268	216	1,431	1,686	686	378
12	Idaho	329	.....	.....	.....	.....	.....	3	2	14	63
13	Illinois	4,022	.....	2	28	12	25	313	820	635	1,327
14	Indiana	13,670	14	27	44	112	213	1,000	3,307	3,871	2,043
15	Indian territory	39	.....	.....	.....	.....	.....	.....	.....	.....	10
16	Iowa	6,135	115	23	10	12	15	197	613	1,348	1,995
17	Kansas	118	.....	.....	.....	3	.....	17	21	30	26
18	Kentucky	6,159	12	24	74	196	253	841	1,985	1,155	493
19	Louisiana	2,695	.....	.....	2	63	6	157	566	588	386
20	Maine	8,112	1	7	14	44	91	530	1,325	2,377	1,516
21	Maryland	1,398	13	3	20	69	76	177	484	249	137
22	Massachusetts	2,686	29	1	3	1	56	91	224	583	557
23	Michigan	43,093	29	57	119	537	186	952	2,943	7,431	11,356
24	Minnesota	9,816	.....	.....	6	13	41	191	605	1,580	1,898
25	Mississippi	3,939	7	11	25	98	230	758	1,009	770	445
26	Missouri	5,090	1	3	16	60	27	381	1,058	1,465	605
27	Montana	549	.....	.....	.....	.....	.....	23	8	13	25
28	Nebraska	162	.....	.....	.....	.....	3	24	17	26	17
29	New Hampshire	4,070	.....	1	9	10	8	285	511	1,153	982
30	New Jersey	571	.....	.....	5	5	14	53	135	155	69
31	New Mexico	318	.....	.....	7	.....	.....	11	.....	14	10
32	New York	11,005	.....	.....	7	29	89	418	2,149	3,084	2,033
33	North Carolina	6,145	30	91	427	1,210	875	1,343	873	588	213
34	North Dakota	138	.....	.....	.....	.....	.....	.....	.....	.....	115
35	Ohio	11,305	5	.....	16	148	118	769	2,025	3,138	1,851
36	Oklahoma	35	.....	.....	.....	.....	.....	.....	12	17	.....
37	Oregon	3,333	2	.....	.....	67	24	78	144	292	255
38	Pennsylvania	17,086	8	2	13	70	97	588	1,967	3,922	4,034
39	Rhode Island	111	.....	.....	.....	.....	.....	1	11	33	21
40	South Carolina	2,347	17	29	141	415	360	589	456	162	47
41	South Dakota	299	.....	5	4	.....	8	13	7	97	34
42	Tennessee	6,999	13	31	56	190	209	1,410	1,926	1,334	616
43	Texas	5,595	22	1	13	31	88	331	1,083	1,081	1,154
44	Utah	201	.....	.....	.....	.....	.....	7	3	24	14
45	Vermont	5,402	.....	3	9	16	88	376	1,587	1,640	708
46	Virginia	5,022	4	8	42	276	340	1,267	1,681	730	255
47	Washington	6,929	5	.....	.....	1	5	41	94	405	508
48	West Virginia	3,857	.....	2	8	29	43	267	1,040	1,315	431
49	Wisconsin	28,111	.....	6	48	117	351	1,738	3,634	5,739	6,395
50	Wyoming	100	.....	.....	.....	.....	.....	.....	6	3	8

PAY, LUMBER MILLS AND SAW MILLS, BY STATES AND TERRITORIES: 1890—Continued.

MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Males above 16 years engaged in—(Continued)													
Mill operations other than planing mill—Cont'd.		Planing mill.											
$40 and over but under $50.	$50 and over.	Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $18.	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.	$40 and over but under $50.	$50 and over.	
43,276	42,742	18,230	.....	*11	34	181	275	950	3,521	3,897	2,898	2,844	3,619	1
303	447	519	.....	.....	.....	.....	.....	77	154	101	42	100	45	2
27	44	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	3
.....	90	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	5	4
802	677	631	.....	.....	.....	68	.....	31	140	186	69	71	66	5
1,010	2,198	275	.....	.....	.....	.....	5	2	2	24	43	37	162	6
172	435	56	.....	.....	.....	.....	.....	.....	3	.....	1	.....	52	7
116	159	34	.....	.....	.....	.....	.....	.....	4	12	15	3	.....	8
50	37	21	.....	.....	.....	.....	.....	10	.....	5	.....	4	2	9
433	367	275	.....	.....	.....	5	5	34	84	66	18	31	32	10
166	431	347	.....	.....	.....	2	.....	42	245	12	25	10	11	11
37	210	28	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	19	12
530	330	150	.....	.....	.....	.....	.....	12	44	16	30	47	1	13
1,469	1,570	882	.....	.....	.....	2	5	13	185	420	104	91	62	14
10	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15
961	846	332	.....	.....	.....	.....	20	5	88	67	71	37	44	16
8	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17
538	588	230	.....	.....	.....	.....	3	11	27	71	9	95	14	18
372	555	265	.....	.....	.....	.....	15	20	46	43	22	7	112	19
1,374	833	332	.....	.....	.....	.....	.....	6	48	40	112	42	75	20
93	77	115	.....	.....	2	.....	.....	12	50	21	23	3	4	21
602	539	334	.....	.....	.....	.....	4	11	24	58	80	82	75	22
10,743	8,740	1,164	.....	.....	3	5	2	28	144	228	248	201	305	23
3,355	2,127	631	.....	.....	.....	.....	5	19	29	67	81	212	218	24
267	269	392	.....	.....	.....	.....	3	40	90	72	45	85	57	25
831	643	326	.....	.....	.....	9	.....	5	71	56	26	95	64	26
29	451	54	.....	.....	.....	.....	.....	.....	.....	1	.....	20	33	27
11	64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28
638	473	239	.....	.....	.....	.....	.....	1	39	52	43	55	49	29
65	70	52	.....	.....	.....	.....	.....	3	6	5	15	14	9	30
118	158	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	3	31
1,261	1,935	1,182	.....	.....	.....	.....	8	46	180	336	315	130	167	32
197	298	315	.....	.....	3	45	44	84	66	18	11	23	21	33
6	17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34
1,229	2,006	760	.....	.....	1	.....	.....	15	69	194	193	168	120	35
4	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	36
952	1,519	394	.....	.....	.....	1	4	15	14	57	26	66	211	37
3,943	2,442	735	.....	9	.....	.....	4	17	86	155	152	159	153	38
32	13	67	.....	.....	.....	.....	.....	.....	17	47	3	.....	.....	39
51	80	45	.....	.....	2	1	14	12	14	2	.....	.....	.....	40
76	55	50	.....	.....	.....	.....	.....	.....	.....	2	14	26	8	41
613	601	754	.....	2	5	4	41	45	258	130	99	68	102	42
909	882	1,027	.....	.....	3	1	.....	14	76	260	275	246	152	43
63	90	25	.....	.....	.....	.....	.....	.....	3	10	.....	.....	12	44
466	509	717	.....	.....	.....	2	12	37	246	273	68	41	38	45
170	249	273	.....	.....	.....	.....	20	43	108	46	9	7	40	46
1,813	4,057	579	.....	.....	.....	.....	.....	.....	.....	10	16	116	437	47
312	410	314	.....	.....	.....	.....	.....	7	112	67	34	18	76	48
6,027	4,056	3,278	.....	.....	15	36	61	233	749	658	561	418	547	49
22	61	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	50

TABLE 4.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT MONTHLY RATES OF

	STATES AND TERRITORIES.	MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.														
		Females above 15 years engaged in—														
		Mill operations other than planing mill.												Planing mill.		
		Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $18.	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.	$40 and over but under $50.	$50 and over.	Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.
1	The United States	1,514	60	52	158	282	260	208	248	85	31	31	99	55	.....	3	.....
2	Alabama	7	.....	1	2	1	.....	.....	.....	.....	1	.....	2	.....	.....	.....	.....
3	Alaska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	Arkansas	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
6	California	30	.....	.....	.....	2	.....	3	2	4	5	11	3	1	.....	.....	.....
7	Colorado	7	.....	.....	.....	.....	1	1	1	2	.....	1	1	.....	.....	.....	.....
8	Connecticut	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
9	Delaware	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	Florida	29	.....	.....	9	15	.....	.....	2	.....	.....	.....	3	.....	.....	.....	.....
11	Georgia	25	11	.....	13	.....	.....	.....	.....	.....	.....	.....	1	5	.....	.....	.....
12	Idaho	2	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
13	Illinois	8	3	1	.....	.....	1	1	1	.....	.....	.....	1	.....	.....	.....	.....
14	Indiana	141	8	6	.....	39	.....	80	1	3	.....	.....	2	17	.....	.....	.....
15	Indian territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16	Iowa	79	1	.....	.....	.....	40	28	1	1	.....	3	5	.....	.....	.....	.....
17	Kansas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18	Kentucky	8	.....	.....	1	6	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
19	Louisiana	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	.....	.....	.....
20	Maine	77	.....	3	13	19	10	3	16	7	1	.....	5	.....	.....	.....	.....
21	Maryland	21	.....	.....	.....	.....	.....	.....	21	.....	.....	.....	.....	.....	.....	.....	.....
22	Massachusetts	12	.....	.....	.....	.....	.....	1	8	1	.....	.....	2	.....	.....	.....	.....
23	Michigan	250	3	9	35	37	45	14	36	33	7	4	27	.....	.....	.....	.....
24	Minnesota	14	.....	.....	2	1	.....	2	4	.....	1	.....	4	.....	.....	.....	.....
25	Mississippi	7	1	2	.....	1	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....
26	Missouri	49	.....	.....	1	1	40	1	.....	1	1	2	2	.....	.....	.....	.....
27	Montana	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
28	Nebraska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
29	New Hampshire	77	.....	2	.....	9	12	6	39	7	.....	.....	2	.....	.....	.....	.....
30	New Jersey	2	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....
31	New Mexico	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
32	New York	81	2	2	14	22	21	10	8	1	1	.....	.....	.....	.....	.....	.....
33	North Carolina	12	6	1	1	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
34	North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	Ohio	47	2	7	8	21	.....	1	5	1	.....	1	1	.....	.....	.....	.....
36	Oklahoma	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
37	Oregon	18	1	7	.....	1	3	1	1	1	2	.....	1	3	.....	3	.....
38	Pennsylvania	84	5	.....	4	10	30	15	6	5	.....	2	7	.....	.....	.....	.....
39	Rhode Island	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
40	South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
41	South Dakota	3	.....	.....	.....	.....	.....	2	.....	.....	.....	1	.....	.....	.....	.....	.....
42	Tennessee	19	7	3	1	6	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....
43	Texas	9	.....	.....	.....	4	.....	1	1	.....	2	.....	1	.....	.....	.....	.....
44	Utah	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
45	Vermont	50	2	.....	30	.....	8	8	.....	1	.....	.....	1	.....	.....	.....	.....
46	Virginia	35	1	1	9	13	1	8	.....	.....	1	.....	1	2	.....	.....	.....
47	Washington	22	2	.....	.....	4	.....	2	1	5	.....	2	6	.....	.....	.....	.....
48	West Virginia	10	.....	.....	3	1	.....	2	1	.....	3	.....	.....	.....	.....	.....	.....
49	Wisconsin	271	5	5	11	66	47	16	87	9	6	2	17	24	.....	.....	.....
50	Wyoming	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....

PAY, LUMBER MILLS AND SAW MILLS, BY STATES AND TERRITORIES: 1890—Continued.

MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Females above 15 years engaged in—(Continued)								Children engaged in—									
Planing mill—(Continued)								Mill operations other than planing mill.					Planing mill.				
$15 and over but under $18.	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.	$40 and over but under $50.	$50 and over.	Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over.	Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over.	
2	1	3	19	20	1	1	5	2,371	556	298	512	1,005	245	30	30	95	90	1
								125	11	4	42	68	39	15	4	20		2
																		3
																		4
			1					37	12	4	13	8						5
		1						6				6						6
																		7
																		8
																		9
								60	29	16		15						10
			5					92	77	3	1	11	6			6		11
								2				2						12
								66	13	13	16	24						13
				17				256	45	15	47	149	2			2		14
																		15
								219	21	28	36	134	5		1		4	16
								2			2							17
								105	68	13	19	5						18
				2				14			7	7						19
								48	6	2	8	32	3				3	20
								31	8		6	17	10		10			21
								2		2								22
								324	59	72	74	119	26	1	10	7	8	23
								21		7		14	2				2	24
								29	2	2	9	16	4				4	25
								24	8	3	10	3	1			1		26
																		27
																		28
								29	8	4	11	6						29
								2			2							30
																		31
								100	30	11	25	34	8		5		3	32
								45	19	9	17		4	4				33
																		34
								253	18	23	66	146	7	5			2	35
																		36
								2	2									37
								111	31	5	21	54	28			4	24	38
																		39
																		40
																		41
								72	5	22	26	19	38			33	5	42
								29	4	2	5	18	2			2		43
																		44
								51	1	21	13	16						45
							2	80	37	8	15	20						46
								10		1		9						47
								38	14	5	4	10	10			10		48
2	1	2	13	1	1	1	3	90	28	3	17	42	50	5		10	35	49
								1				1						50

TABLE 5.—DETAILED STATEMENT, TIMBER PRODUCTS NOT MANUFACTURED BY

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.									
			Value of hired property.	Direct investment.								
				Aggregate.	Timbered land or standing timber.	Plant.						
						Total.	Tools, implements, and live stock.	Logging, railways and equipment.	Canals and chutes.	River improvements.	Vessels.	All other items of investment in plant.
1	The United States	1,606	$1,396,818	$61,541,086	$30,894,979	$6,928,110	$3,196,888	$1,457,307	$109,705	$286,740	$571,404	$1,306,066
2	Alabama	35	11,250	234,938	91,075	46,583	33,613	1,200	8,000	220	250	3,300
3	Arkansas	16	2,000	109,777	47,850	21,028	14,478	.....	.....	50	.....	6,500
4	California	37	3,500	350,599	211,720	72,575	42,925	1,800	17,000	.....	10,800	50
5	Colorado	11	.....	102,905	28,450	8,915	8,665	.....	.....	.....	.....	250
6	Connecticut	19	4,000	81,930	28,810	19,705	17,275	.....	.....	200	.....	2,230
7	Florida	13	2,400	29,867	6,270	7,825	7,475	.....	.....	.....	50	300
8	Georgia	15	12,500	135,067	89,625	33,410	26,160	7,000	250	.....	.....	.....
9	Idaho	3	.....	42,250	.....	16,050	12,550	3,500	.....	.....	.....	.....
10	Illinois	6	10,000	38,650	16,000	16,130	13,630	.....	.....	2,500	.....	.....
11	Indiana	30	8,300	148,897	45,316	33,107	26,232	25	.....	.....	.....	6,850
12	Iowa	6	4,000	42,510	4,300	13,425	5,425	1,000	.....	.....	.....	7,000
13	Kentucky	4	.....	16,400	2,700	5,200	4,400	.....	.....	.....	.....	800
14	Louisiana	5	.....	127,715	65,500	12,915	8,535	3,300	.....	.....	80	1,000
15	Maine	63	20,700	1,094,868	322,602	153,975	125,225	3,050	.....	13,750	2,600	9,350
16	Maryland	5	2,400	10,100	5,360	2,370	2,370	.....	.....	.....	.....	.....
17	Massachusetts	24	.....	133,827	60,000	18,855	16,655	.....	.....	.....	.....	2,200
18	Michigan	206	64,303	18,476,744	9,209,983	2,025,869	519,856	180,978	200	55,135	517,678	752,022
19	Minnesota	75	79,900	11,121,863	8,396,805	817,060	454,360	125,500	.....	85,000	3,500	148,700
20	Mississippi	26	17,950	65,559	15,788	8,691	7,136	.....	.....	.....	300	1,255
21	Missouri	82	15,000	587,307	181,517	274,088	57,220	200,000	5,000	.....	50	11,818
22	New Hampshire	39	1,000	1,369,787	782,405	346,547	91,862	175,300	.....	2,500	.....	76,885
23	New Jersey	4	.....	10,978	5,900	4,056	1,256	.....	.....	.....	.....	2,800
24	New York	70	.....	696,291	137,868	103,866	71,101	15,000	200	275	.....	17,290
25	North Carolina	25	12,800	57,218	17,290	20,297	14,395	4,900	.....	25	32	945
26	Ohio	34	1,600	71,043	25,663	11,110	6,810	.....	.....	.....	.....	4,300
27	Oregon	50	57,200	560,165	229,645	170,825	82,150	52,350	12,650	2,550	25	21,100
28	Pennsylvania	95	20,070	1,584,520	861,240	217,077	106,777	89,900	1,100	5,500	.....	13,800
29	Rhode Island	3	.....	9,235	4,300	3,115	2,615	.....	.....	.....	.....	500
30	South Carolina	24	7,500	120,940	27,720	14,650	12,345	130	.....	.....	100	2,075
31	Tennessee	33	.....	72,900	27,694	17,500	15,615	160	.....	.....	.....	1,725
32	Texas	30	7,500	500,844	171,065	139,746	38,283	75,793	220	.....	.....	25,450
33	Vermont	43	1,545	174,379	83,110	21,535	17,770	.....	.....	.....	.....	3,765
34	Virginia	25	8,500	62,925	25,110	17,195	8,930	1,500	1,500	.....	300	4,965
35	Washington	152	151,450	1,954,878	657,695	633,294	363,755	149,700	41,340	12,600	2,525	63,374
36	West Virginia	26	.....	545,042	352,550	43,862	22,322	5,390	.....	8,000	.....	8,150
37	Wisconsin	266	869,450	20,772,278	8,656,053	1,544,829	933,187	359,831	22,245	98,435	26,114	105,017
38	All other states and territories (a)	4	.....	15,890	.....	10,830	3,530	.....	.....	.....	7,000	300

a Includes states and territories having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Delaware, 1; Montana, 1; Utah, 2.

MILLING ESTABLISHMENTS, BY STATES AND TERRITORIES: 1890.

CAPITAL—continued.			MISCELLANEOUS EXPENSES.						
Direct investment—Continued.									
Live assets.									
Total.	Value of product on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.	Total.	Rent paid for tenancy (not including cost of stumpage).	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	
$23,717,997	$15,149,249	$8,568,748	$3,708,364	$78,967	$362,801	$105,246	$140,145	$390,914	$2,630,291	1
97,280	80,380	16,900	4,201	450	917	179	1,530	205	920	2
40,899	23,490	17,409	3,369	100	192	240	946	1,541	350	3
66,304	45,580	20,724	16,581	470	3,880	329	3,415	3,730	4,757	4
65,540	37,115	28,425	5,365	.....	1,037	153	1,565	2,150	460	5
33,415	14,540	18,875	2,053	200	362	143	100	563	685	6
25,772	12,636	13,136	864	120	28	26	390	150	150	7
12,032	4,935	7,097	1,779	500	226	462	570	19	2	8
26,200	11,200	15,000	15	.....	15	.....	.....	.....	.....	9
6,520	4,720	1,800	6,575	500	364	50	220	341	5,100	10
70,474	44,440	26,034	4,084	415	636	287	1,348	1,081	317	11
24,785	12,160	12,625	4,093	200	208	.....	200	3,000	485	12
8,500	8,300	200	625	.....	75	.....	550	.....	.....	13
49,300	24,300	25,000	3,222	.....	55	.....	1,282	610	1,275	14
618,291	462,865	155,426	23,814	1,035	3,893	1,438	4,034	10,724	2,690	15
2,370	1,175	1,195	331	110	100	55	55	11	.....	16
54,972	39,662	15,310	2,457	.....	835	206	280	1,061	75	17
7,240,892	3,953,580	3,287,312	1,263,682	3,861	114,941	63,200	17,765	153,331	910,584	18
1,907,998	718,809	1,189,189	462,186	4,800	44,133	4,025	14,914	43,310	350,995	19
41,080	19,620	21,460	4,189	718	460	40	265	454	2,252	20
131,702	78,471	53,231	8,635	676	1,171	146	2,485	1,633	2,524	21
240,835	130,270	110,565	39,045	56	5,318	3,611	2,250	3,330	24,474	22
1,022	622	400	144	.....	56	22	.....	.....	66	23
454,557	320,932	133,625	31,170	.....	1,016	4,159	2,600	5,733	17,662	24
19,631	11,517	8,114	4,564	640	366	180	1,445	385	1,548	25
34,270	20,655	13,615	1,396	100	252	107	188	19	730	26
159,695	116,985	42,710	20,034	2,860	1,818	251	4,240	2,457	8,408	27
506,203	359,140	147,063	39,799	1,811	6,570	2,946	5,467	7,094	15,911	28
1,820	770	1,050	2,214	.....	114	200	100	.....	1,800	29
78,570	45,715	32,855	2,697	300	172	.....	200	1,590	435	30
27,706	17,749	9,957	4,019	.....	163	.....	205	154	3,497	31
190,033	133,158	56,875	21,300	300	3,029	1,634	5,202	9,585	1,490	32
69,734	54,487	15,247	4,791	85	606	144	190	1,061	2,705	33
20,620	15,385	5,235	2,553	425	194	38	321	350	1,225	34
663,889	540,325	123,564	60,795	6,058	4,949	475	21,442	8,993	18,878	35
148,630	104,123	44,507	9,933	.....	2,393	400	2,826	2,175	2,139	36
10,571,396	7,676,738	2,894,658	1,645,429	52,177	162,246	20,100	41,145	124,059	1,245,702	37
5,060	2,700	2,360	361	.....	11	.....	350	.....	.....	38

TABLE 5.—DETAILED STATEMENT, TIMBER PRODUCTS NOT MANUFACTURED BY

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.											
		Aggregates.		Officers or firm members.		Engineers, blacksmiths, and other skilled workmen and foremen.		Hewers.		Choppers.		Skidders.	
		Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States	46,142	$11,353,608	907	$514,559	2,302	$843,285	1,939	$493,395	11,850	$2,503,234	5,559	$1,205,679
2	Alabama	614	124,866	21	12,924	16	5,292	69	13,545	266	45,675	9	2,249
3	Arkansas	276	56,166	10	4,846	6	2,440	77	14,507	99	19,336	7	1,404
4	California	392	158,691	23	9,800	9	6,805	24	8,380	151	59,900	2	600
5	Colorado	313	106,055	6	4,880	6	3,850	59	19,750	162	57,744	11	3,100
6	Connecticut	136	43,470	5	2,450	14	5,661	7	2,500	36	11,940	.....	.....
7	Florida	341	48,597	2	650	3	1,240	73	9,745	92	14,625	.....	.....
8	Georgia	348	115,001	5	2,665	21	9,960	25	6,977	32	7,192	1	400
9	Idaho	34	20,350	1	1,800	3	4,000	.....	.....	21	9,500	.....	.....
10	Illinois	58	11,340	3	1,000	10	5,400	11	430	20	1,710	2	400
11	Indiana	547	168,367	11	4,905	54	19,015	163	51,660	59	17,398	.....	.....
12	Iowa	105	195,480	3	1,400	11	1,100	1	300	20	7,680	.....	.....
13	Kentucky	81	17,415	5	1,460	5	485	13	3,135	21	6,135	.....	.....
14	Louisiana	414	81,574	6	3,150	7	1,850	4	312	23	3,576	.....	.....
15	Maine	3,167	422,690	33	13,766	83	17,161	9	1,742	1,630	212,371	270	33,502
16	Maryland	23	2,601	5	780	1	84	.....	.....	10	974	.....	.....
17	Massachusetts	161	35,059	8	3,762	3	1,242	7	1,154	59	10,997	3	810
18	Michigan	10,292	2,722,172	133	105,872	320	172,604	322	111,812	2,106	498,392	1,289	327,933
19	Minnesota	5,991	1,261,453	99	68,291	366	128,486	359	89,757	1,744	335,725	718	147,951
20	Mississippi	317	45,863	14	5,654	5	2,102	46	6,233	53	8,543	3	720
21	Missouri	1,514	576,785	28	9,890	101	27,214	154	24,907	196	53,736	1	80
22	New Hampshire	1,075	284,917	8	1,629	20	9,035	41	7,156	356	90,484	81	27,895
23	New Jersey	22	5,276	1	500	6	1,896	.....	.....	6	2,400	.....	.....
24	New York	1,391	362,008	27	10,069	55	23,395	23	4,395	267	58,105	177	43,529
25	North Carolina	273	49,083	8	2,730	1	168	6	1,460	107	16,394	5	1,075
26	Ohio	199	44,056	9	3,558	12	2,172	3	310	81	15,301	2	728
27	Oregon	757	224,798	19	8,785	17	6,514	32	11,900	247	64,363	90	27,353
28	Pennsylvania	1,890	544,462	36	14,744	51	20,943	89	29,274	344	85,691	80	16,032
29	Rhode Island	17	6,950	.....	.....	3	1,350	.....	.....	9	3,300	.....	.....
30	South Carolina	349	59,627	7	1,780	3	1,100	97	10,030	61	6,660	1	46
31	Tennessee	277	45,325	11	2,170	10	2,125	1	50	31	5,676	5	150
32	Texas	999	369,707	26	17,882	89	31,655	74	25,035	248	83,855	92	39,608
33	Vermont	311	39,699	10	2,690	3	700	5	850	67	8,175	21	1,727
34	Virginia	368	41,613	11	3,265	41	7,152	14	2,700	73	11,396	1	275
35	Washington	2,432	1,108,376	96	64,938	61	42,988	64	27,400	538	243,299	414	175,620
36	West Virginia	478	89,059	21	7,520	34	10,975	12	710	174	35,021	17	3,650
37	Wisconsin	10,123	1,852,757	194	111,154	841	259,726	55	5,279	2,439	389,865	2,257	348,842
38	All other states and territories	58	11,920	2	1,200	11	6,000	.....	.....	2	600	.....	.....

MILLING ESTABLISHMENTS, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.						ANIMALS IN USE.		MATERIALS USED.					
Teamsters.		Pieceworkers.		All other employés.		Average number.	Cost of keep.	Total cost.	Standing timber.			Cost of all other materials.	
									Quantity.		Cost. (Stumpage value.)		
Number.	Wages.	Number.	Wages.	Number.	Wages.				Number of cords.	Number of 1,000 feet, scaled measure.			
6,392	$1,495,300	9,704	$2,503,050	7,489	$1,795,106	22,053	$1,479,426	$11,006,678	534,668	3,728,142	$10,451,339	$555,339	1
107	20,476	114	22,790	12	1,915	578	34,381	69,899	2,500	60,962	65,924	3,975	2
36	6,368	22	3,850	19	3,415	184	9,320	15,199	.....	13,606	14,599	600	3
68	31,290	46	15,362	69	26,554	313	29,227	65,222	44,414	14,939	58,552	6,670	4
66	15,951	.....	.....	3	780	194	13,465	37,365	14,871	12,398	26,690	10,675	5
29	10,819	44	9,950	1	150	95	10,063	23,809	2,760	5,917	21,925	1,884	6
22	5,239	142	16,380	7	718	132	8,269	11,694	.....	12,771	11,694	.....	7
33	10,290	218	75,575	13	1,942	287	23,700	41,222	.....	31,907	40,888	334	8
9	5,050	.....	.....	.....	.....	94	8,705	57,925	825	28,600	57,925	.....	9
7	900	3	300	2	1,200	52	1,585	13,706	3,035	1,399	12,870	836	10
69	26,225	183	47,940	8	1,224	145	8,778	59,525	18,914	26,393	58,105	1,420	11
13	3,725	57	181,275	.....	.....	12	1,800	14,455	.....	9,411	14,430	25	12
15	3,600	12	600	10	2,000	18	900	4,570	500	1,900	4,150	420	13
12	1,050	361	71,480	1	156	158	11,490	16,035	.....	18,375	16,035	.....	14
415	53,653	402	48,677	325	41,818	907	52,353	278,028	.....	125,919	264,065	13,963	15
1	35	6	728	.....	.....	11	351	684	10	289	534	150	16
32	8,068	48	8,786	1	240	85	5,980	36,185	1,512	16,932	33,575	2,610	17
1,038	288,282	3,334	684,451	1,750	532,826	2,367	226,478	3,812,831	252,918	819,490	3,678,951	133,880	18
1,185	223,848	103	16,290	1,417	251,105	3,445	158,392	1,499,538	465	373,218	1,423,208	76,330	19
50	7,538	142	14,573	4	500	179	6,460	15,268	.....	11,770	14,303	965	20
177	38,265	808	413,465	49	9,228	408	17,534	116,135	10,506	80,605	111,975	4,160	21
197	48,753	289	66,882	83	33,083	648	44,930	135,635	20	68,800	129,035	6,600	22
.....	.....	9	480	.....	.....	8	14	3,450	.....	597	3,350	100	23
191	45,981	492	143,655	159	32,879	381	16,553	148,847	40,337	71,010	147,982	865	24
63	12,619	62	10,522	21	4,115	196	13,723	31,777	600	33,141	29,571	2,206	25
39	10,872	51	19,555	1	540	203	8,560	28,385	10,327	7,854	28,185	150	26
86	35,077	80	25,040	186	45,766	663	45,781	82,237	19,240	86,070	71,683	10,554	27
118	31,757	1,144	342,882	28	3,139	520	38,567	284,635	10,050	311,844	276,805	7,830	28
5	2,300	.....	.....	.....	.....	12	808	3,930	800	600	3,930	.....	29
29	3,451	151	36,560	.....	.....	281	22,460	21,507	.....	11,649	21,077	430	30
43	5,909	146	24,685	30	4,560	295	9,722	26,624	520	20,761	26,564	60	31
160	67,423	239	81,539	71	23,210	617	34,027	98,802	17,333	89,455	98,431	371	32
60	6,650	139	17,037	6	1,870	219	7,842	31,062	1,050	16,720	29,612	1,450	33
43	6,570	178	9,444	7	811	168	6,113	20,516	300	12,483	20,016	500	34
213	146,987	127	39,364	919	367,780	2,087	223,278	400,893	41,660	402,771	308,913	91,980	35
37	20,028	72	2,900	61	8,855	485	30,438	54,786	13,260	22,770	53,830	956	36
1,670	289,251	441	55,913	2,226	392,727	5,556	344,929	3,436,847	24,241	899,816	3,264,457	172,390	37
4	1,000	39	3,120	.....	.....	30	2,450	7,500	1,500	5,000	7,500	.....	38

TABLE 5.—DETAILED STATEMENT, TIMBER PRODUCTS NOT MANUFACTURED BY

	STATES AND TERRITORIES.	PRODUCTS.								
		Total value.	Basket stock.		Cooperage stock.		Excelsior stock.		Fence posts.	
			Cords.	Value.	Cords.	Value.	Cords.	Value.	Number.	Value.
1	The United States	$34,289,807	1,871	$14,497	31,784	$222,990	6,576	$25,880	3,822,623	$239,895
2	Alabama	371,975							76,000	8,220
3	Arkansas	143,035			2,984	15,763			7,000	200
4	California	340,691			850	4,175			414,400	44,382
5	Colorado	191,559							30,000	2,500
6	Connecticut	116,808	55	4,500					24,200	2,223
7	Florida	90,572							75	7
8	Georgia	239,100								
9	Idaho	201,800								
10	Illinois	44,215			160	980			2,500	270
11	Indiana	313,730			9,345	51,225	5,500	22,000	600	18
12	Iowa	227,237							15,000	1,350
13	Kentucky	35,346			1,250	23,700				
14	Louisiana	145,459								
15	Maine	942,216			600	3,000			8,700	960
16	Maryland	5,190							3,200	260
17	Massachusetts	101,609	32	406	100	1,000			18,300	2,590
18	Michigan	9,637,663			318	535			1,144,719	69,481
19	Minnesota	4,062,122							700,000	50,000
20	Mississippi	99,613			2,300	24,580			120	12
21	Missouri	872,081	100	1,000	1,090	7,385			846,330	23,377
22	New Hampshire	624,383	140	1,250			76	380	32,150	1,866
23	New Jersey	10,242							5,000	500
24	New York	702,736			750	6,550	1,000	3,500	35,850	2,730
25	North Carolina	131,055	75	750					3,000	200
26	Ohio	118,113			205	1,460			5,000	480
27	Oregon	535,842							2,000	120
28	Pennsylvania	1,315,136	60	600	1	5			20,925	4,106
29	Rhode Island	20,135	300	2,500					1,200	185
30	South Carolina	164,167			500	2,000			4,500	450
31	Tennessee	131,691	356	968	1,267	20,050			50,340	5,034
32	Texas	614,309			400	4,400			2,000	240
33	Vermont	114,857							27,000	1,400
34	Virginia	88,775			1,097	8,905				
35	Washington	2,382,674								
36	West Virginia	275,725			1,036	19,600				
37	Wisconsin	8,850,705	258	2,523	7,531	27,697			342,514	16,794
38	All other states and territories	27,250								

MILLING ESTABLISHMENTS, BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.												
Fence rails.		Hop poles.		Hoop poles and hoops.		Hewed timber.		Hard wood and other logs for export.		All logs for domestic manufacture.		
Number.	Value.	Number.	Value.	Number.	Value.	Number of 1,000 feet, board measure.	Value.	Number of 1,000 feet, scaled measure.	Value.	Number of 1,000 feet, scaled measure.	Value.	
76,500	$5,289	3,012,900	$23,558	49,112,060	$368,425	55,592	$575,395	152,770	$1,001,328	2,703,289	$19,468,768	1
						28,123	159,835	2,575	22,000	5,820	21,280	2
5,000	50					1,620	30,000	300	3,750	2,526	17,078	3
		160,000	1,200			2,435	14,200			650	6,650	4
												5
						7	161	460	4,775	2,850	31,575	6
								518	4,300	1,014	6,900	7
						22	5,100	106	1,000	6,985	44,800	8
								12,000	60,000			9
3,000	100							600	3,600	600	6,450	10
				85,000	1,700			853	9,110	2,045	18,895	11
				29,220,210	202,037							12
												13
								6,150	34,200	1,500	7,500	14
2,100	162			2,053,000	10,210	190	5,700	29,030	168,492	75,411	617,020	15
2,000	60											16
3,500	220			20,000	600	21	341	1,470	7,850	5,000	35,460	17
8,000	225	2,469,000	19,521	3,380,000	18,010	9,539	233,928	9,595	96,512	481,390	4,838,129	18
										242,671	1,903,865	19
1,500	18					1,383	11,906	505	3,036	4,410	29,433	20
4,700	418	3,900	37	15,629,850	114,309	260	1,420	110	1,200	6,042	44,760	21
3,000	300			80,000	280	75	250	12,573	95,886	70,302	463,155	22
				152,000	2,100					400	5,000	23
1,000	60	20,000	300	325,000	2,387	4,060	51,050	4,737	24,708	55,464	396,599	24
										30,261	111,282	25
14,800	1,582			102,000	280			91	2,225	450	2,700	26
		10,000	300					11,400	60,756	71,570	389,520	27
25,400	1,849					3,548	33,484	2,363	26,140	127,718	643,336	28
												29
						3,300	24,220	100	450	3,305	16,400	30
				4,700,000	6,600			150	1,300	10,720	48,943	31
2,000	200					20	300	1,120	8,100	71,754	391,596	32
								720	6,850	11,785	71,515	33
				1,275,000	6,037	430	3,150	690	6,500	2,360	12,940	34
								31,300	157,700	390,656	2,164,630	35
300	41							20	200	20,233	154,762	36
200	4	350,000	2,200	1,090,000	3,875			23,300	190,700	997,375	6,966,475	37
						50	350			22	120	38

TABLE 5.—DETAILED STATEMENT, TIMBER PRODUCTS NOT MANUFACTURED BY

	STATES AND TERRITORIES.	PRODUCTS—continued.											
		Handle stock.		Hemlock bark.		Oak bark.		Piles.		Paving stock.		Pulp stock.	
		Cords.	Value.	Cords.	Value.	Cords.	Value.	Number.	Value.	Cords.	Value.	Cords.	Value.
1	The United States	5,070	$40.908	70,871	$289,796	14,495	$71,938	161,711	$184.838	79,881	$202.646	31,640	$139,808
2	Alabama					300	1,800	500	500				
3	Arkansas	700	4.850					6,540	4,160				
4	California			400	6,000	830	6,820	7,700	9,600				
5	Colorado												
6	Connecticut	39	370					2,056	4,026				
7	Florida							900	675				
8	Georgia												
9	Idaho							2,000	2,000				
10	Illinois							725	575				
11	Indiana	1,750	11,750					13,750	17,662				
12	Iowa							1,600	4,000				
13	Kentucky												
14	Louisiana												
15	Maine			1,856	10,414	20	100	1,475	2,675			14,727	64,919
16	Maryland					51	410						
17	Massachusetts			200	1,500			1,400	2,300				
18	Michigan			5,854	15,960			4,606	10,650	58,781	116,737	1,553	5,749
19	Minnesota							13,000	26,000	18,000	65,000		
20	Mississippi							2,400	3,150				
21	Missouri	175	2,702	120	875	50	500	64,951	28,717	40	200		
22	New Hampshire	45	1,250	1,027	5,812	20	140	1,116	3,568			825	4,025
23	New Jersey												
24	New York	231	981	5,500	12,652					100	500	900	4,220
25	North Carolina												
26	Ohio	730	13,375			796	4,429						
27	Oregon			10	100			404	1,480			200	600
28	Pennsylvania	1,000	3,130	53,624	226,255	973	4,912	800	1,490				
29	Rhode Island							200	500				
30	South Carolina							5,710	4,060				
31	Tennessee	400	2,500	600	3,750	920	7,540	1,000	2,100				
32	Texas							830	900	2,000	16,000		
33	Vermont			445	2,205							1,100	5,500
34	Virginia					1,640	7,955	4,250	4,200	40	200		
35	Washington							12,408	30,240				
36	West Virginia					1,395	7,332					11,860	53,370
37	Wisconsin			1,145	4,273	7,500	30,000	2,390	11,610	920	4,009	475	1,425
38	All other states and territories							10,000	8,000				

MILLING ESTABLISHMENTS, BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.

Railway ties.		Rived or shaved shingles.		Masts and spars.		Ship knees.		Charcoal.		Telegraph poles.		Wheel stock.		Amount received for contract labor.	Value of all other products.	
Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Bushels.	Value.	Number.	Value.	Cords.	Value.			
8,817,245	$2,319,403	38,250	$107,912	899	$13,330	2,925	$27,200	19,180,172	$1,339,524	184,468	$272,453	868	$11,300	$2,472,792	$4,849,934	1
113,000	30,300							1,303,200	77,240	50,950	47,700				3,100	2
150,700	34,284	13,050	32,750							500	150					3
256,000	37,900	3,455	11,630			150	750								197,384	4
267,000	79,600							2,325,350	86,959	4,000	2,500				20,000	5
79,700	31,280					225	450	20,000	1,400	400	1,500				34,548	6
278,200	69,829														8,861	7
604,000	162,000	900	1,900					325,000	19,500						4,800	8
540,000	135,000							33,000	3,300	1,000	1,500					9
7,000	2,260							320,000	30,000							10
474,385	154,966	1,360	2,077					110,500	12,080			180	900		10,747	11
10,000	4,000														15,850	12
20,700	5,196							58,900	4,450						2,000	13
325,000	103,750															14
7,100	1,139	1,000	2,000	62	620	2,400	25,000			200	100				29,705	15
2,000	750														3,710	16
39,575	13,257							85,800	9,654	3,400	5,900	1	30		20,501	17
754,163	139,072	1,804	6,184	12	560			8,573,704	646,871	101,480	187,639			960,711	2,271,189	18
275,000	86,060													598,655	1,332,602	19
1,000	200	3,855	14,290												12,994	20
2,101,164	583,898	2,012	3,980					500,000	40,000						17,323	21
37,563	14,114	440	1,136	10	600	150	1,000	58,000	5,650	400	850	340	3,750		19,121	22
1,652	800														1,842	23
58,900	25,295	1,140	2,350	85	1,700			2,132,518	128,085	7,053	13,616				25,453	24
13,050	3,123	2,440	13,300												2,400	25
224,450	35,500	302	754					532,200	43,070			270	5,600		6,658	26
145,717	43,507	20	40							100	200				39,225	27
74,905	28,295			200	600			1,268,000	118,750	655	591	22	220		221,373	28
10,000	5,000									230	550				11,400	29
388,200	111,662	870	4,070							200	200				655	30
93,200	27,456	2,070	4,550							500	500				400	31
447,725	130,573	50	175					700,000	54,350	300	600				6,915	32
1,825	400	1,025	2,087					10,000	850						24,050	33
92,000	26,505	15	49							2,000	2,520	55	800		8,984	34
				530	9,250										20,854	35
22,100	5,510	2,165	3,490												1,420	36
900,271	186,982	277	500					464,000	42,195	11,100	5,807			30,000	470,210	37
								360,000	15,120					883,426	3,660	38

TABLE 6.—AVERAGE NUMBER OF EMPLOYÉS, AVERAGE TERM OF EMPLOYMENT, AND AVERAGE MONTHLY EARNINGS, TIMBER PRODUCTS NOT MANUFACTURED BY MILLING ESTABLISHMENTS, BY STATES AND TERRITORIES: 1890. (*a*)

[Pieceworkers are not included in this table.]

STATES AND TERRITORIES.	Number of establishments reporting.	OFFICERS OR FIRM MEMBERS ACTIVELY ENGAGED IN THE BUSINESS OR IN SUPERVISION.			OPERATIVES, SKILLED AND UNSKILLED.		
		Males above 16 years.			Males above 16 years.		
		Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.
Alabama	35	21	7.67	$80.27	478	7.15	$26.07
Arkansas	16	10	7.70	62.94	244	7.81	24.91
California	37	23	7.78	54.75	315	9.42	44.48
Colorado	11	6	7.00	116.19	306	8.97	36.76
Connecticut	19	5	7.80	62.82	86	10.85	33.14
Florida	13	2	7.00	46.43	194	7.22	22.28
Georgia	15	5	10.20	52.25	125	10.56	27.85
Idaho	3	1	11.00	163.64	33	10.39	54.08
Illinois	6	3	2.67	125.00	52	4.40	43.84
Indiana	30	11	7.64	58.39	353	10.58	30.95
Iowa	6	3	12.00	38.89	45	9.44	30.13
Kentucky	4	5	9.60	30.42	64	9.34	25.68
Louisiana	5	6	4.83	108.62	47	4.40	33.55
Maine	63	33	6.09	68.49	2,730	5.57	23.68
Maryland	5	5	5.80	26.90	12	4.08	22.31
Massachusetts	24	8	5.88	80.04	105	6.91	31.01
Michigan	206	133	7.10	112.15	6,797	8.40	33.75
Minnesota	75	99	5.96	115.75	5,789	5.55	36.65
Mississippi	28	14	8.43	47.92	161	7.22	22.06
Missouri	82	28	8.18	43.19	675	8.68	26.18
New Hampshire	39	8	5.63	36.20	778	8.50	32.73
New Jersey	4	1	12.00	41.67	12	10.00	35.80
New York	70	27	7.15	52.17	865	6.59	36.32
North Carolina	25	8	9.63	35.45	200	9.12	19.57
Ohio	34	9	7.00	56.48	138	8.72	24.87
Oregon	50	19	5.47	84.47	634	5.30	55.33
Pennsylvania	95	36	6.67	61.43	698	8.43	31.52
Rhode Island	3	.....	.....	.....	17	9.35	43.71
South Carolina	24	7	8.14	31.23	191	4.91	22.69
Tennessee	33	11	6.18	31.91	120	5.61	27.44
Texas	30	26	9.31	73.89	730	10.05	36.73
Vermont	43	10	7.20	37.36	162	3.82	32.26
Virginia	25	11	7.00	42.40	178	7.01	23.03
Washington	152	96	7.63	88.71	2,161	8.13	56.40
West Virginia	26	21	7.52	47.59	385	7.98	25.59
Wisconsin	266	194	4.47	128.06	9,422	4.80	37.09
All other states and territories (*b*)	4	2	12.00	50.00	17	10.94	40.86

a The average number of months employed and average monthly earnings are computed from individual returns. The average number of employés reported by each establishment is multiplied by the number of months embraced by the term of operation. Aggregating such results of individual returns the number of months required for 1 employé to perform the labor is obtained. This number divided by the number of employés gives the true average number of months employed, and divided into the total wages, the true average monthly earnings.

b Includes states and territories having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Delaware, 1; Montana, 1; Utah, 2.

TABLE 6.—AVERAGE NUMBER OF EMPLOYÉS, AVERAGE TERM OF EMPLOYMENT, AND AVERAGE MONTHLY EARNINGS, TIMBER PRODUCTS NOT MANUFACTURED BY MILLING ESTABLISHMENTS, ETC.—Continued.

STATES AND TERRITORIES.	Number of establishments reporting.	OPERATIVES, SKILLED AND UNSKILLED—continued.					
		Females above 15 years.			Children.		
		Average number.	Average number of months employed.	Average monthly earnings per employé.	Average number.	Average number of months employed.	Average monthly earnings per employé.
Alabama	35	1	3.00	$8.33			
Arkansas	16						
California	37	8	8.00	24.86			
Colorado	11	1	9.00	33.33			
Connecticut	19	1	12.00	12.50			
Florida	13	3	11.00	10.64			
Georgia	15						
Idaho	3						
Illinois	6						
Indiana	30						
Iowa	6						
Kentucky	4						
Louisiana	5						
Maine	63	2	2.00	15.00			
Maryland	5						
Massachusetts	24						
Michigan	206	25	5.72	32.78	3	4.33	$21.54
Minnesota	75						
Mississippi	28						
Missouri	82	2	2.75	16.00	1	1.50	13.33
New Hampshire	39						
New Jersey	4						
New York	70	7	7.29	26.43			
North Carolina	25	3	7.33	6.23			
Ohio	34						
Oregon	50	24	5.67	37.94			
Pennsylvania	95	11	8.73	12.94	1	12.00	8.83
Rhode Island	3						
South Carolina	24						
Tennessee	33						
Texas	30	4	10.00	21.50			
Vermont	43						
Virginia	25	1	12.00	15.00			
Washington	152	43	7.33	36.39	5	9.60	35.63
West Virginia	26						
Wisconsin	266	65	5.25	21.30	1	4.00	18.75
All other states and territories	4						

TABLE 7.—AVERAGE NUMBER OF EMPLOYÉS AT THE DIFFERENT MONTHLY RATES OF PAY, TIMBER

[Pieceworkers are not

	STATES AND TERRITORIES.	Number of establishments reporting.	MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS AND FIRM MEMBERS, BUT NOT THOSE EMPLOYED ON PIECEWORK. (a) Males above 16 years.											
			Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $18	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.	$40 and over but under $50.	$50 and over.
1	The United States	1,606	36,226	77	89	583	1,374	509	4,084	7,371	5,498	5,334	5,986	5,321
2	Alabama	35	499	15	9	26	16	21	63	165	64	49	33	38
3	Arkansas	16	254				19	19	85	83	25	3	3	17
4	California	37	338			13	1		7	37	15	17	97	151
5	Colorado	11	312						33	34	117		92	36
6	Connecticut	19	91		1		5			6	27	16	31	5
7	Florida	13	196	47	3	16	21	1	2	84	5	2	4	1
8	Georgia	15	130	2		7	1	9	25	48	21	1		16
9	Idaho	3	34										21	13
10	Illinois	6	55				12	3		10	13	4	1	12
11	Indiana	30	364				8	7	12	199	15	66	35	22
12	Iowa	6	48			3			10	1	32		2	
13	Kentucky	4	69		2			10	9	38	9		1	
14	Louisiana	5	53				1		14	8	15		6	9
15	Maine	63	2,763	2	4	5	892	133	833	395	321	126	29	23
16	Maryland	5	17		1			10	1		1		4	
17	Massachusetts	24	113				10		36	19	5	14	18	11
18	Michigan	206	6,930	1	4	14	51	94	1,276	1,092	1,505	1,671	819	403
19	Minnesota	75	5,888			301	3	13	288	1,806	816	557	1,212	892
20	Mississippi	28	175	1		11	45	11	36	35	8	6	10	12
21	Missouri	82	703	3	24	60	74	45	77	200	111	26	26	57
22	New Hampshire	39	786					13	137	116	93	210	161	56
23	New Jersey	4	13							4	6		3	
24	New York	70	892			2	5	16	25	285	151	129	135	144
25	North Carolina	25	208	2	8	27	57	30	44	34		1	1	4
26	Ohio	34	147		26		15		9	26	28	20	17	6
27	Oregon	50	653							10	12	47	116	468
28	Pennsylvania	95	734		2		20	5	130	179	151	123	84	40
29	Rhode Island	3	17								1	3	8	5
30	South Carolina	24	198		3	25	43	21	35	56	7	4	1	3
31	Tennessee	33	131					2	36	45	32	7	9	
32	Texas	30	756		1	2	15	2	14	88	205	146	121	162
33	Vermont	43	172			2	7	8	7	32	66	35	2	13
34	Virginia	25	189	4	1	11	16	11	68	40	14	2	15	7
35	Washington	152	2,257						1	8	77	121	550	1,500
36	West Virginia	26	406			52	2	21	56	101	100	32	20	22
37	Wisconsin	266	9,616			6	25	4	715	2,083	1,428	1,892	2,299	1,164
38	All other states and territories (b)	4	19							4	2	4		9

a In comparing the table of monthly rates of wages and number of employés at each rate with the average monthly earnings presented in Table 6, it must be remembered that it is not practicable to obtain true average monthly earnings from the table of monthly rates, because the term of employment varies for employés reported at the respective rates.

PRODUCTS NOT MANUFACTURED BY MILLING ESTABLISHMENTS, BY STATES AND TERRITORIES: 1890.

included in this table.]

MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS AND FIRM MEMBERS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Females above 15 years.												Children.					
Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $18.	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.	$40 and over but under $50.	$50 and over.	Total number.	Under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over.	
201	14	6	8	13	8	31	65	18	8	14	16	11	1	.....	2	8	1
1	1																2
																	3
8				1	2	3	1			1							4
1								1									5
1			1														6
3	2		1														7
																	8
																	9
																	10
																	11
																	12
																	13
																	14
2				2													15
																	16
																	17
25		1		2	1	8	7	2		2	2	3				3	18
																	19
																	20
2			1				1					1			1		21
																	22
																	23
7					1		2	4									24
3	2		1														25
																	26
24			1			2	5	4	3	5	4						27
11	4		2	3		2						1	1				28
																	29
																	30
																	31
4		1					3										32
																	33
1				1													34
43						8	7	7	5	6	10	5			1	4	35
																	36
65	5	4	1	4	4	8	39					1				1	37
																	38

b Includes states and territories having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Delaware, 1; Montana, 1; Utah, 2.

TABLE 8.—DETAILED STATEMENT, TAR

	STATES.	Number of establishments reporting.	CAPITAL. Direct investment. Value of hired property.	Aggregate.	Timbered land or standing timber.	Plant. Total.	Tools, implements, and live stock.	Logging, railways and equipment.	River improvements.	Vessels.	All other items of investment in plant.
1	The United States	670	$26,500	$4,062,375	$1,670,378	$1,117,265	$911,685	$2,550	$100	$5,400	$197,530
2	Florida	15	.....	182,992	102,842	35,175	29,475	.....	.....	.....	5,700
3	Georgia	228	.....	2,242,592	903,283	666,114	547,039	500	.....	3,600	114,975
4	Mississippi	24	26,500	173,698	87,050	39,868	29,018	250	.....	.....	10,600
5	North Carolina	194	.....	785,055	269,341	195,265	158,630	1,800	.....	1,700	33,135
6	South Carolina	201	.....	605,873	270,552	160,568	137,248	.....	100	100	23,120
7	All other states (a)	8	.....	72,165	37,310	20,275	10,275	.....	.....	.....	10,000

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.

	STATES.	Aggregates. Average number.	Aggregates. Total wages.	Officers or firm members. Number.	Officers or firm members. Wages.	Coopers, stillers, and other skilled workmen, and foremen. Number.	Coopers, stillers, and other skilled workmen, and foremen. Wages.	Chippers. Number.	Chippers. Wages.	Dippers. Number.	Dippers. Wages.	Teamsters. Number.	Teamsters. Wages.
1	The United States	15,315	$2,933,491	49	$26,944	2,869	$783,833	7,403	$1,323,611	2,578	$419,557	1,392	$268,968
2	Florida	484	93,269	.....	.....	96	28,684	252	42,779	93	13,895	36	7,315
3	Georgia	9,911	2,012,396	22	14,210	1,707	502,217	5,191	974,002	1,952	328,207	707	150,841
4	Mississippi	645	117,626	25	11,184	113	29,645	173	31,393	77	12,073	66	15,354
5	North Carolina	1,747	273,668	1	50	429	86,250	587	83,929	178	27,478	292	43,233
6	South Carolina	2,243	378,768	.....	.....	498	121,233	1,125	167,478	213	29,384	275	48,130
7	All other states	285	57,744	1	1,500	46	15,804	135	24,030	65	8,520	16	4,115

MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS AND FIRM MEMBERS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

	STATES.	Males above 16 years—Continued. $10 and over but under $12.	$12 and over but under $15.	$15 and over but under $18.	$18 and over but under $20.	$20 and over but under $25.	$25 and over but under $30.	$30 and over but under $35.	$35 and over but under $40.	$40 and over but under $50.	$50 and over.	Females above 15 years. Total number.	Under $10.
1	The United States	478	1,216	4,528	2,396	3,950	799	333	173	227	262	16	11
2	Florida	13	51	132	92	97	44	27	19	.....	2	.....	.....
3	Georgia	341	573	3,032	1,648	2,946	368	159	88	155	200	.....	.....
4	Mississippi	.....	12	61	69	79	109	45	27	12	24	.....	.....
5	North Carolina	31	252	492	248	393	143	28	14	4	7	13	11
6	South Carolina	93	283	747	335	365	109	63	20	48	23	3	.....
7	All other states	.....	45	64	4	70	26	11	5	8	6	.....	.....

MATERIALS USED—continued.

	STATES.	Wood. Cords.	Wood. Cost.	Barrels purchased. Number.	Barrels purchased. Cost.	Iron. Pounds.	Iron. Cost.	Staves and heading. Pieces.	Staves and heading. Cost.	Cost of all other materials.
1	The United States	76,910	$60,558	1,243,117	$640,801	621,610	$16,558	3,411,440	$29,952	$413,734
2	Florida	1,645	1,313	30,238	16,681	17,000	880	144,000	1,000	8,785
3	Georgia	43,956	36,098	568,820	334,624	383,370	11,699	2,423,500	21,070	252,137
4	Mississippi	2,994	1,543	28,264	14,614	32,100	1,402	100,640	1,282	1,785
5	North Carolina	12,215	7,860	274,093	109,712	11,240	280	52,000	210	73,185
6	South Carolina	15,445	13,229	320,203	156,295	171,400	1,377	609,800	5,665	64,941
7	All other states	655	515	21,499	8,875	6,500	920	81,500	725	12,901

a Includes states grouped, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Alabama, 7; Missouri, 1.

AND TURPENTINE, BY STATES: 1890.

CAPITAL—continued.			MISCELLANEOUS EXPENSES.						
Direct investment—Continued.									
Live assets.									
Total.	Value of product on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	
$1,274,732	$663,271	$611,461	$178,662	$1,063	$21,918	$5,591	$60,337	$30,567	$39,186	1
44,975	18,375	26,600	5,520	.....	1,083	42	1,117	2,728	550	2
673,195	369,410	303,785	108,003	.....	11,177	3,660	37,555	34,343	21,268	3
46,780	33,220	13,560	9,754	1,063	1,576	490	1,610	2,832	2,183	4
320,449	150,354	170,095	20,038	.....	3,541	801	8,289	2,318	5,089	5
174,753	80,232	94,521	32,056	.....	3,678	421	10,566	7,950	9,441	6
14,580	11,680	2,900	3,291	.....	863	177	1,200	396	655	7

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.											MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS AND FIRM MEMBERS, BUT NOT THOSE EMPLOYED ON PIECEWORK.		
Pieceworkers.						All other employés.							
Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.	
Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Total number.	Under $10.
543	$72,761	125	$9,419	93	$4,761	166	$22,642	16	$925	1	$50	14,537	175	1
6	500	1	96	.....	.....	.....	.....	.....	.....	.....	.....	477	.....	2
270	37,924	40	3,985	16	700	6	310	.....	.....	.....	.....	9,585	75	3
86	11,184	51	3,485	54	3,308	.....	.....	.....	.....	.....	.....	454	16	4
55	7,948	18	1,290	15	603	158	22,182	13	675	1	50	1,645	33	5
104	11,430	15	563	8	150	2	150	3	250	.....	.....	2,113	27	6
22	3,775	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	263	24	7

MONTHLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS AND FIRM MEMBERS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.			ANIMALS IN USE.		MATERIALS USED.									
Females above 15 years—Cont'd.		Children.				Crude turpentine purchased.		Scrape turpentine purchased.		Glue.		Cotton batting.		
$10 and over but under $12.	$12 and over but under $15.	Under $10.	Average number.	Cost of keep.	Total cost.	Barrels.	Cost.	Barrels.	Cost.	Pounds.	Cost.	Pounds.	Cost.	
3	2	1	4,800	$368,253	$2,506,440	655,642	$1,303,302	32,692	$32,259	64,266	$6,389	19,014	$2,887	1
.....	.....	.....	123	9,615	36,250	3,400	7,000	.....	.....	3,000	315	1,640	276	2
.....	.....	.....	2,755	215,710	785,976	51,278	119,105	3,892	3,949	49,696	4,885	15,965	2,409	3
.....	.....	.....	211	15,885	87,017	33,880	66,230	.....	.....	1,100	136	120	25	4
.....	2	1	833	58,320	959,982	386,900	754,688	13,800	13,695	1,950	337	100	15	5
3	.....	.....	808	64,473	612,910	180,064	356,179	14,900	14,550	7,520	617	289	57	6
.....	.....	.....	70	4,250	24,305	60	100	100	65	1,000	99	900	105	7

PRODUCTS.													
Total value.	Turpentine.						Resin.		Tar.		Barrels made (not filled or included in the value of other products).		Value of all other products.
	Scrape.		Crude.		Spirits of.								
	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.	Number.	Value.	
$8,677,379	8,482	$9,878	30,509	$62,972	346,524	$5,459,115	1,429,154	$2,413,757	992	$1,711	32,310	$13,890	$116,056	1
191,859	.....	.....	.....	.....	7,598	126,929	31,000	64,780	.....	.....	.....	.....	150	2
4,242,255	1,000	1,500	3,700	7,400	189,558	2,732,042	670,588	1,474,353	.....	.....	7,050	2,515	24,445	3
282,060	7,132	2,078	3,675	5,070	12,078	181,142	60,150	89,887	332	664	8,360	1,575	1,650	4
1,705,583	.....	.....	.....	.....	72,888	1,293,086	365,233	377,310	600	847	2,000	300	34,290	5
1,524,100	350	6,300	23,134	50,502	60,873	1,039,421	283,116	383,167	.....	.....	14,900	9,500	35,210	6
131,266	.....	.....	.....	.....	3,529	86,495	19,067	24,260	60	200	.....	.....	20,311	7

NEWSPAPERS AND PERIODICALS.

NEWSPAPERS AND PERIODICALS.

This report presents the statistics concerning the printing and publishing of newspapers and periodicals for the census year ending May 31, 1890, and includes the returns of establishments whose product amounted to $500 or more during the census year, except establishments engaged in printing publications for gratuitous distribution, such as advertising sheets, theater programmes, and almanacs.

At the census of 1880 the statistics concerning newspapers and periodicals formed the subject of a separate report under the title "The newspaper and periodical press", and only included data pertaining exclusively to the printing and publishing of newspapers and periodicals, the statistics relating to book and job printing done by such establishments being excluded. The statistics for newspapers and periodicals were not shown separately in the general report on manufactures for the Tenth Census, but the data which appeared under the class of "Printing and publishing" included in many instances reports from establishments that were also included in the report on "The newspaper and periodical press". The statistics for 1890 for "Printing and publishing, book and job", and other classes of printing, shown in detail in the general report on manufactures, do not include any establishments classed as "Newspapers and periodicals". The totals for "Newspapers and periodicals", however, include the entire operations of each establishment.

The questions contained in the schedules of inquiry concerning printing and publishing and newspapers and periodicals in 1880 were not uniform. Owing to changes in the form of the inquiry used at the census of 1890, as compared with that of 1880, and to the fact that in some instances establishments included as newspapers and periodicals in 1880 were also included under "Printing and publishing", the totals for the several branches of the printing industry reported at the two censuses should not be used to compute the percentages of increase or decrease during the decade. The following comparative summary, however, presents the totals for the industry as reported in the general statistics on manufactures at the censuses of 1880 and 1890. This summary includes for 1880 the classification "Printing and publishing", and for 1890 the classifications "Printing and publishing, book and job"; "Printing and publishing, music"; "Printing and publishing, newspapers and periodicals", and "Printing, tip".

COMPARATIVE SUMMARY, PRINTING AND PUBLISHING: 1880 AND 1890.

[The figures for 1880 do not include newspapers and periodical establishments which did no printing.]

ITEMS.	1880	1890
Number of establishments reporting	3,467	16,566
Capital	$62,983,704	$195,387,445
Miscellaneous expenses	(a)	$46,971,768
Average number of employés (aggregate)	58,478	165,227
Total wages	$30,531,657	$105,083,075
Officers, firm members, and clerks:		
Average number	(b)	28,391
Total wages	(b)	$26,272,756
All other employés:		
Average number	(b)	136,836
Total wages	(b)	$78,810,319
Cost of materials used	$32,460,395	$68,858,915
Value of products	$90,789,341	$275,452,515

a Not reported. b Not reported separately.

The following statement shows the statistics, as reported at the Eleventh Census, for each of the several branches of the printing and publishing industry that form the total given in the preceding statement:

TOTALS FOR DIFFERENT BRANCHES OF THE PRINTING AND PUBLISHING INDUSTRY: 1890.

BRANCHES.	Number of establishments reporting.	Capital.	Miscellaneous expenses.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.						Cost of materials used.	Value of product.
				Aggregates.		Officers, firm members, and clerks.		All other employés.			
				Average number.	Total wages.	Number.	Wages.	Number.	Wages.		
Total	16,566	$195,387,445	$46,971,768	165,227	$105,083,075	28,391	$26,272,756	136,836	$78,810,319	$68,858,915	$275,452,515
Printing and publishing, book and job.	4,098	67,146,445	10,855,620	58,139	35,874,361	7,992	8,225,370	50,147	27,648,991	29,387,211	93,540,831
Printing and publishing, music.	79	1,816,205	362,117	701	448,582	239	224,799	462	223,783	401,415	1,683,333
Printing and publishing, newspapers and periodicals.	12,362	126,269,885	35,727,039	106,095	68,601,532	20,120	17,777,173	a85,975	a50,824,359	38,955,322	179,859,750
Printing, tip	27	154,910	26,992	292	158,600	40	45,414	252	113,186	114,967	368,601

a Includes editors, subeditors, and reporters.

Of the total value of products, $275,452,515, shown in the above statement for the printing and publishing industry, the product reported for establishments engaged in printing and publishing newspapers and periodicals forms 65.30 per cent, while the product shown for book and job printing as a distinct branch forms 33.96 per cent, "Printing and publishing, music", 0.61 per cent, and "Printing, tip", 0.13 per cent.

The following comparative summary presents the statistics relating only to the printing and publishing of newspapers and periodicals, as reported at the censuses of 1880 and 1890:

COMPARATIVE SUMMARY, NEWSPAPERS AND PERIODICALS: 1880 AND 1890.

ITEMS.	1880	1890
Number of establishments reporting	(a)	12,362
Capital	b$53,000,000	$126,269,885
Miscellaneous expenses	(a)	$35,727,039
Average number of employés (aggregate)	71,615	106,095
Total wages	$28,559,336	$68,601,532
Officers, firm members, and clerks:		
Average number	(c)	20,120
Total wages	(c)	$17,777,173
All other employés:		
Average number	(c)	85,975
Total wages	(c)	$50,824,359
Total cost of materials used	(a)	$38,955,322
Pounds of paper used	189,145,048	852,876,161
Total value of newspaper products	$89,009,074	$143,586,448
Advertising	$39,136,306	$71,243,361
Subscriptions and sales	$49,872,768	$72,343,087
Book and job printing	(a)	$32,812,113
All other products	(a)	$3,461,189
Total value of all products in 1890		$179,859,750
Number of publications (d)	10,132	14,901
Aggregate circulation per issue	31,779,686	69,138,934
Aggregate number of copies printed during the year	2,067,848,209	4,681,113,530

a Not reported.
b Estimated.
c Not reported separately.
d Does not include 1,182 publications in 1880 for which data concerning employés, wages, materials, product, and circulation were not reported, and does not include 2,715 publications in 1890 for which no reports were received.

As previously explained, the figures for 1880 do not include any data other than that which relates exclusively to newspapers and periodicals, while the figures for 1890 cover the entire printing and publishing business of each establishment reporting, it being impossible to make an accurate separation of all the items pertaining strictly to newspapers and periodicals as distinguished from the book and job printing business carried on by the same establishments. Items, however, such as number of publications, circulation, and amounts received from advertising, subscriptions, and sales, that relate exclusively to newspapers and periodicals reported at the two censuses, are comparable.

From an extended correspondence and a careful checking of newspaper directories, it appears there were 2,715 publications in existence during 1890 that failed to make reports to this office.

There were 17,616 newspapers and periodicals of all classes in existence during the census year 1890 as compared with 11,314 in 1880, an increase of 55.70 per cent.

The aggregate circulation per issue for all classes of newspapers and periodicals from which reports were received was 69,138,934 in 1890 as compared with 31,779,686 in 1880, an increase of 117.56 per cent, while the aggregate number of copies printed during the year has increased from 2,067,848,209 to 4,681,113,530, or 126.38 per cent. The quantity of paper consumed has increased from 189,145,048 pounds in 1880 to 552,876,161 pounds in 1890, or 192.30 per cent.

In 1880, $39,136,306 is reported as received for advertising as compared with $71,243,361 in 1890, or an increase of 82.04 per cent. The amount received for subscriptions and sales in 1880 was $49,872,768 as compared with $72,343,087 in 1890, or an increase of 45.06 per cent.

The amount received for subscriptions and sales appears as the principal source of revenue in both 1880 and 1890, although the amount received for advertising in 1890 exceeds the amount received for subscriptions and sales in a majority of the states. The receipts of newspaper establishments from sources such as book and pamphlet publications, job printing, bookbinding, blank-book making, engraving, and all other products were not included in 1880. These items aggregate $36,273,302 in 1890, or 20.17 per cent of the total product.

In the following comparative statement the number of newspapers and periodicals reported as in existence at the censuses of 1880 and 1890 are arranged according to period of issue and character of publication, the percentage of increase or decrease being shown for each class:

COMPARATIVE SUMMARY, NEWSPAPERS AND PERIODICALS, CLASSIFIED ACCORDING TO PERIODS OF ISSUE AND CHARACTER OF PUBLICATION: 1880 AND 1890.

PERIODS OF ISSUE AND CHARACTER OF PUBLICATION.	NUMBER OF PUBLICATIONS.		Percentage of increase.
	1880	1890	
Periods of issue	11,314	17,616	55.70
Daily	971	1,731	78.27
Weekly	8,633	12,721	47.35
Semiweekly	133	214	60.90
Triweekly	73	40	a45.21
Monthly	1,167	2,247	92.54
Quarterly	116	271	133.62
All other	221	392	77.38
Character of publication:			
News, politics, and family reading	8,863	13,147	48.34
Religious	553	1,182	113.74
Agriculture, horticulture, dairy, and stock raising	173	312	80.35
Commerce, finance, insurance, railroads, and trade	363	778	114.33
General literature, including magazines	189	387	104.76
Medicine and surgery	114	187	64.04
Law	45	51	13.33
Science and mechanics	68	123	80.88
Freemasonary, Odd Fellowship, and temperance	149	277	85.91
Education and history, including college and school periodicals	248	396	59.68
Society, art, music, and fashion	72	198	175.00
Miscellaneous (b)	477	578	21.17

a Decrease.

b For purposes of comparison, 1880 includes 217 children's publications and Sunday school papers, and 1890, 173 Sunday publications (not connected with daily newspapers).

From the above statement it appears that there has been an increase in the number of papers and periodicals published at each of the different periods of issue except triweekly, the number for this class having decreased from 73 to 40, or 45.21 per cent. At the census of 1880 the statistics relating to daily newspapers show 438 morning and 533 evening papers. The statistics of 1890 show 599 morning papers, or an increase of 36.76 per cent, and 1,132 evening papers, or an increase of 112.38 per cent.

The number of newspapers and periodicals reported under each of the different characters of publication has increased during the past decade. The greatest percentage of increase, 175 per cent, is shown for the class "Society, art, music, and fashion". The number of publications reported by the different periods of issue, also the number reported for each of the different subdivisions shown for the character of publication in each state and territory, as reported at the censuses of 1880 and 1890, is shown in Table 3.

The following comparative statement presents the number and circulation of newspapers and periodicals by different periods of issue, as reported for the censuses of 1850 to 1890, inclusive:

COMPARATIVE STATEMENT, NUMBER AND CIRCULATION OF NEWSPAPERS AND PERIODICALS, CLASSIFIED ACCORDING TO PERIODS OF ISSUE: 1850–1890.

YEARS.	ALL CLASSES.			DAILY.		WEEKLY.		SEMIWEEKLY.	
	Number.	Aggregate circulation per issue.	Aggregate copies issued during the year.	Number.	Aggregate circulation per issue.	Number.	Aggregate circulation per issue.	Number.	Aggregate circulation per issue.
1850	2,526	5,142,177	426,409,978	254	758,454	1,902	2,944,629	31	53,511
1860	4,051	13,663,409	927,951,545	387	1,478,435	3,173	7,581,930	79	175,165
1870	5,871	20,842,475	1,508,548,250	574	2,601,547	4,295	10,594,643	115	247,197
1880	a11,314	b31,779,686	2,067,848,209	971	3,566,395	8,633	16,266,830	133	264,910
1890	c17,616	69,138,934	4,681,113,530	1,731	8,387,188	12,721	28,954,515	214	561,743

YEARS.	TRIWEEKLY.		MONTHLY.		QUARTERLY.		ALL OTHER.	
	Number.	Aggregate circulation per issue.	Number.	Aggregate circulation per issue.	Number.	Aggregate circulation per issue.	Number.	Aggregate circulation per issue.
1850	115	75,712	100	740,651	19	25,875	105	543,345
1860	86	107,170	280	3,411,959	30	101,000	16	807,750
1870	107	155,105	622	5,650,843	49	211,670	109	1,381,470
1880	73	68,086	1,167	8,139,881	116	1,944,269	221	1,379,285
1890	40	50,067	2,247	19,624,038	271	8,124,500	392	3,436,883

a Includes 1,182 publications reporting no circulation.
b Includes 150,000 circulation for 5 weeklies, 1 semimonthly, 14 monthlies, and 12 quarterlies not reported separately.
c Includes 2,715 publications in existence from which returns were not received.

The total number of publications "All classes" has increased from 2,526 in 1850 to 17,616 in 1890. The number shown for each of the different periods of issue has increased steadily during each decade with the exception of triweekly; the number of triweekly publications shown for 1850 was 115, while for 1890 it was but 40.

The average circulation per issue for all classes of newspapers and periodicals, also the average circulation per issue for daily, weekly, semiweekly, triweekly, monthly, quarterly, and all other papers and periodicals, as obtained from the returns of the Tenth and Eleventh censuses, is given in the following statement:

COMPARATIVE STATEMENT, AVERAGE CIRCULATION PER ISSUE, NEWSPAPERS AND PERIODICALS: 1880 AND 1890.

PERIODS OF ISSUE.	AVERAGE CIRCULATION PER ISSUE.	
	1880	1890
All classes	3,122	4,640
Daily	4,137	5,209
Weekly	2,113	2,678
Semiweekly	2,136	2,896
Triweekly	1,001	1,473
Monthly	7,834	11,317
Quarterly	16,505	36,109
All other	6,474	11,851

One of the characteristics of the press of the United States is the great number of different languages in which newspapers and periodicals are published. The following comparative statement shows the number of papers printed in different languages, as reported at the censuses of 1880 and 1890:

COMPARATIVE STATEMENT, NUMBER OF NEWSPAPERS AND PERIODICALS REPORTED AS PRINTED IN DIFFERENT LANGUAGES: 1880 AND 1890.

LANGUAGES.	NUMBER OF PUBLICATIONS.		LANGUAGES.	NUMBER OF PUBLICATIONS.	
	1880	1890		1880	1890
Total	11,314	17,616	Hebrew		6
Armenian		1	Hungarian		2
Bohemian	13	25	Indian	3	
Bohemian and English		1	Irish	1	
Catalan	1		Italian	4	14
Chinese	2	3	Italian and English		2
Choctaw and English		1	Lithuanian		1
Dutch	9	18	Polish	2	22
English	10,515	16,457	Portuguese	2	2
Finnish		4	Scandinavian (a)	49	130
French	41	43	Slavonic, not specified		2
French and English		6	Spanish	26	33
Gaelic		1	Spanish and English		7
Gaelic and English		3	Volapuk		2
German	641	790	Volapuk and English		1
German and English		30	Welsh	5	4
German and Hebrew		4	Welsh and English		1

a Embraces Norwegian, Swedish, and Danish.

The number of newspapers printed in foreign languages has increased from 799 in 1880 to 1,159 in 1890, or 45.06 per cent. The number published in foreign languages was 7.06 per cent of all papers published in 1880 and 6.58 per cent of all published in 1890. The preceding figures for 1890 include the 52 publications printed in English and some foreign language. The number of languages in which papers are printed has increased from 17 in 1880 to 23 in 1890. The Eleventh Census shows 8 languages that were not reported at 1880, while the Tenth Census shows 2 languages not reported for 1890. The number of publications in the different languages for each state and territory, as reported at the census of 1880 and that of 1890, is shown in Table 4.

CAPITAL.

The impracticability of obtaining accurate statistics as to the value of all classes of capital invested in newspapers and periodicals is explained in the report on "The newspaper and periodical press" for the Tenth Census. For the reasons there given, no attempt was made to ascertain the amount of capital invested in this industry at the census of 1880, although, on page 79 of that report, it is stated the capital for 1880 would approximate $53,000,000. The form of inquiry concerning capital used at the Eleventh Census, with the total amount reported for each item in the entire industry, is as follows:

Capital invested (both owned and borrowed):		
Value of plant (the value should be estimated at what the printing office would cost in 1890, if then to be erected, with such allowance for depreciation as may be suitable in the individual case):		
Land	$10,409,896	
Buildings	11,769,253	
Machinery, type, and presses	56,580,885	
Total		$78,760,034
Live capital:		
Printing paper and other stock on hand	5,997,471	
Work in process and finished products on hand	5,866,454	
Cash on hand, bills receivable, unsettled ledger accounts, and sundries not included in any of the foregoing items	35,645,926	
Total		47,509,851
Average annual allowance since June 1, 1880, for depreciation of buildings and machinery (a)		

a This question was imperfectly answered, and the amounts reported have not been tabulated and are not included in this report.

The items enumerated above do not include the value of property held in tenancy, for which an annual rental of $3,884,824 is shown to have been paid. In many cases the rent reported is paid for offices; it therefore should not

be considered as an indication of the value of the land and buildings rented in which manufacturing operations are conducted.

The amount of capital invested in newspapers and periodicals, as reported at the census of 1870, was $14,947,887; the estimated value of capital in 1880 was $53,000,000, or an increase over 1870 of 254.57 per cent. The total capital reported for the census of 1890 is $126,269,885, or an increase of 138.25 per cent over 1880. The statistics of capital are shown in detail for the different states and territories in Table 5.

MISCELLANEOUS EXPENSES.

In addition to questions concerning the amount paid as wages and the cost of materials, the schedule of inquiry used in 1890 contained a number of questions pertaining to expenses of a miscellaneous character. These statistics are shown in the following statement:

MISCELLANEOUS EXPENSES, NEWSPAPERS AND PERIODICALS: 1890.

Total	$35,727,039
Rent paid for tenancy	3,884,824
Taxes	605,687
Insurance	638,257
Repairs, ordinary, of buildings and machinery	996,355
Interest paid on cash used in the business	680,127
All sundries not elsewhere reported	28,921,789

The amount, $28,921,789, shown as expended for "All sundries not elsewhere reported" includes a number of important and necessary expenditures, such as commissions on advertising, contributions, telegrams, associated press privileges, postage, and amounts paid for composition or presswork when done by contract. The schedule of inquiry contained the question "State whether the publishers do their own printing". The following statement shows the number of establishments in each state that did not do their own composition or presswork during the census year 1890:

NUMBER OF NEWSPAPER ESTABLISHMENTS WHICH DID NOT DO THEIR OWN COMPOSITION OR PRESSWORK, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	Number of establishments.	STATES AND TERRITORIES.	Number of establishments.
Total	1,179	Mississippi	5
		Missouri	36
Alabama	10	Montana	2
Arkansas	3	Nebraska	14
California	34	New Hampshire	4
Colorado	1	New Jersey	12
Connecticut	17	New York	322
Delaware	1	North Carolina	9
Florida	3	North Dakota	1
Georgia	16	Ohio	55
Illinois	71	Oregon	6
Indiana	40	Pennsylvania	189
Iowa	33	Rhode Island	11
Kansas	13	South Carolina	2
Kentucky	9	South Dakota	2
Louisiana	20	Tennessee	12
Maine	9	Texas	14
Maryland	7	Virginia	22
Massachusetts	93	Washington	8
Michigan	26	West Virginia	5
Minnesota	19	Wisconsin	23

EMPLOYÉS AND WAGES.

Owing to changes in the form of the inquiry and to the fact that the employés and wages reported for 1890 include those engaged on job printing, the statistics shown under this head can not be used to ascertain the percentages of increase or decrease during the decade. The form of the inquiry relating to employés and wages in 1880 was as follows: "Total number of persons employed in manufacture, male ——, female ——. Number employed in editorial and reportorial work. Amount annually paid in wages". The questions used in 1890 called for the average number and total wages of males above 16 years, females above 15 years, and children, for the

following classes: (1) engineers, pressmen, electrotypers, binders, compositors paid by the week, proof readers, foremen, and other skilled workmen employed on weekly wages; (2) officers or firm members (actively employed); (3) clerks, bookkeepers, etc.; (4) editors, subeditors, and reporters, not included in the above; (5) watchmen, laborers, teamsters, and other unskilled workmen; (6) pieceworkers (compositors). The average number of persons employed at specified weekly rates of wages was also required. In this report classes 1 and 5 have been combined and are presented as "Operatives, skilled and unskilled". It is believed these questions obtained the true average number of employés of all classes engaged during the year and the full amount paid as wages or credited to the wage account, including the salary of the proprietor.

The statistics for employés and wages are presented in detail in Table 5 accompanying this report. The following statement shows the average number of males above 16 years, females above 15 years, and children, with the total wages and the average annual earnings per employé for each of the 5 classes enumerated above:

AVERAGE NUMBER OF EMPLOYÉS, TOTAL WAGES, AND AVERAGE ANNUAL WAGES PER EMPLOYÉ, BY CLASSES, NEWSPAPERS AND PERIODICALS: 1890.

CLASSES.	AGGREGATE.		MALES ABOVE 16 YEARS.			FEMALES ABOVE 15 YEARS.			CHILDREN.		
	Average number.	Total wages.	Average number.	Total wages.	Average annual wages per employé.	Average number.	Total wages.	Average annual wages per employé.	Average number.	Total wages.	Average annual wages per employé.
All classes	106,095	$68,601,532	88,000	$63,657,852	$723.38	12,131	$4,301,560	$354.59	5,964	$642,120	$107.67
Officers or firm members	11,200	11,475,877	10,972	11,326,208	1,032.28	228	149,669	656.44	.....	.....	.....
Editors, subeditors, and reporters	10,538	10,749,422	10,050	10,443,351	1,039.14	488	306.071	627.19	.....	.....	.....
Clerks and bookkeepers	8,920	6,301,296	6,604	5,371,597	813.39	2,316	929,099	401.42	.....	.....	.....
Operatives, skilled and unskilled	60,582	29,259,125	47,442	26,482,191	558.20	7,200	2,138,021	296.95	5,940	638,913	107.56
Pieceworkers	14,855	10,815,812	12,932	10,034,505	775.94	1,899	778,100	409.74	24	3,207	133.63

Of the 106,095 employés receiving $68,601,532 in wages reported for newspapers and periodicals, 10.56 per cent receiving 16.73 per cent of the total wages are returned as officers or firm members, 8.41 per cent receiving 9.18 per cent of the total wages as clerks, 9.93 per cent receiving 15.67 per cent of the total wages as editors, subeditors, and reporters, 14.00 per cent receiving 15.77 per cent of the total wages as pieceworkers, while all other employés represent 57.10 per cent of the total number and receive 42.65 per cent of the total wages.

There were 88,000 male employés reported for the industry, or 82.95 per cent of the entire number. There were 12,131 females, or 11.43 per cent, and 5,964 children, or 5.62 per cent of the total.

The following statement shows the average number of all classes of employés, excluding pieceworkers, reported at specified weekly rates of wages:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, INCLUDING OFFICERS, FIRM MEMBERS, EDITORS, SUBEDITORS, REPORTERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK, NEWSPAPERS AND PERIODICALS: 1890.

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	75,068	10,232	5,940
Under $5	7,914	3,137	5,731
$5 and over but under $6	3,663	1,692	144
$6 and over but under $7	3,394	1,560	34
$7 and over but under $8	3,394	914	a31
$8 and over but under $9	3,718	688	.....
$9 and over but under $10	5,229	505	.....
$10 and over but under $12	9,138	762	.....
$12 and over but under $15	11,043	457	.....
$15 and over but under $20	13,657	288	.....
$20 and over but under $25	6,396	88	.....
$25 and over	7,522	51	.....

a Includes children receiving $7 and over.

MATERIALS.

The total cost of materials used by establishments engaged in the publication of newspapers and periodicals during the census year 1890 is reported as amounting to $38,955,322. It is impossible to ascertain the exact proportion of this amount used in the publication of newspapers and periodicals as distinct from job printing. The quantity of paper consumed on newspapers and periodicals is reported as 552,876,161 pounds, valued at $23,905,384, or an average cost per pound of 4.32 cents. The questions required the quantity and value of paper used on certain classes of publications and in book and job printing to be reported separately. The results are summarized in the following statement:

QUANTITY AND COST OF PAPER USED AND AVERAGE COST PER POUND, NEWSPAPERS AND PERIODICALS: 1890.

ITEMS.	Pounds.	Cost.	Average cost per pound. (Cents.)
Total	670,929,492	$33,889,736	5.05
Paper used on dailies	326,620,576	11,930,793	3.65
Paper used on weeklies, semiweeklies, and triweeklies	170,260,470	8,765,517	5.15
Paper used on monthlies, quarterlies, and all others	55,995,115	3,209,074	5.73
Paper used in book and job printing	118,053,331	9,984,352	8.46

Of the total quantity of paper consumed in printing newspapers and periodicals, 59.08 per cent is used on the dailies, 30.79 per cent on the weeklies, semiweeklies, and triweeklies, and 10.13 per cent on the monthlies, quarterlies, and all others.

There is reported 8,496,697 pounds of ink used during the census year 1890, valued at $1,428,921, or an average price per pound of 16.82 cents. This includes ink used for all classes of work.

The cost of production, which includes the cost of materials, wages, and miscellaneous expenses, amounts to $143,283,893. Of this amount materials form 27.19 per cent; wages, including the salaries of officers, firm members, and clerks and editors, 47.88 per cent, and miscellaneous expenses, 24.93 per cent.

The difference between the cost, $143,283,893, and the value of products, $179,859,750, must not be considered as profit or earnings of capital. The census inquiry was intended only to ascertain the relation that capital, miscellaneous expenses, wages, cost of materials, and value of product bear to each other.

PRODUCTS.

Detailed statistics concerning the different products reported for newspapers and periodicals in the United States and in each state and territory are presented in Table 5. The following statement shows the value reported for the different classes of product and the percentage each is of the total:

CLASSES OF PRODUCT AND PERCENTAGE THE AMOUNT REPORTED FOR EACH IS OF TOTAL PRODUCT, NEWSPAPERS AND PERIODICALS: 1890.

CLASSES OF PRODUCT.	Amount.	Percentage of total product.
Total	$179,859,750	100.00
Advertising	71,243,361	39.61
Subscriptions and sales	72,343,087	40.22
Book and job printing	32,812,113	18.24
All other products	3,461,189	1.93

The two principal sources of revenue and the only products that pertain strictly to newspapers and periodicals are the amounts received for advertising and subscriptions and sales. The amounts received from these sources aggregate $143,586,448, of which advertising forms 49.62 per cent and subscriptions and sales 50.38 per cent.

CIRCULATION.

The aggregate circulation per issue for all classes of newspapers and periodicals during the census year 1890 was 69,138,934, distributed as follows: dailies, 8,387,188, or 12.13 per cent; weeklies, 28,954,515, or 41.88 per cent; semiweeklies, 561,743, or 0.81 per cent; triweeklies, 50,067, or 0.07 per cent; monthlies, 19,624,038, or 28.39 per cent; quarterlies, 8,124,500, or 11.75 per cent, and all other, 3,436,883, or 4.97 per cent of the aggregate.

The aggregate number of copies printed during the census year for all classes of newspapers and periodicals was 4,681,113,530, distributed as follows: dailies, 2,782,282,406, or 59.44 per cent; weeklies, 1,492,460,587, or 31.88 per cent; semiweeklies, 57,637,353, or 1.23 per cent; triweeklies, 7,634,350, or 0.16 per cent; monthlies, 232,617,133, or 4.97 per cent; quarterlies, 32,479,100, or 0.70 per cent, and all other, 76,002,601, or 1.62 per cent of the aggregate.

While the circulation per issue of daily newspapers is smaller than that of the weekly or monthly, it represents more than one-half of the grand aggregate of copies printed for all classes of papers during the year.

That the aggregate circulation of newspapers and periodicals is not dependent upon the number of different publications is illustrated by the totals for the state of New York. The aggregate circulation per issue for all classes of newspapers and periodicals in New York was 18,031,391, or 26.08 per cent of the entire circulation, while only 11.00 per cent of the different newspapers and periodicals are published in that state.

In the following statement the states and territories are ranked according to the aggregate circulation per issue during the census year for all classes of newspapers and periodicals and by the different periods of issue:

RANK OF STATES AND TERRITORIES ACCORDING TO AGGREGATE CIRCULATION PER ISSUE, NEWSPAPERS AND PERIODICALS: 1890.

STATES AND TERRITORIES.	All classes.	Daily.	Weekly.	Semi-weekly.	Tri-weekly.	Monthly.	Quarterly.	All other.	STATES AND TERRITORIES.	All classes.	Daily.	Weekly.	Semi-weekly.	Tri-weekly.	Monthly.	Quarterly.	All other
Alabama	27	31	27	24	.....	37	9	30	Montana	41	36	41	29	10	42	.....	31
Arizona	46	45	46	.....	.....	.....	.....	.....	Nebraska	20	18	16	31	.....	18	.....	14
Arkansas	32	39	28	.....	.....	34	.....	33	Nevada	49	43	50	.....	.....	.....	.....	.....
California	12	7	12	13	12	15	15	18	New Hampshire	26	29	25	26	.....	29	.....	.....
Colorado	28	23	32	22	8	25	.....	.....	New Jersey	9	11	19	21	8	6	18	23
Connecticut	21	14	26	25	.....	11	16	22	New Mexico	45	46	45	.....	.....	.....	.....	34
Delaware	43	35	42	.....	.....	40	.....	.....	New York	1	1	1	2	1	1	2	2
Dist. of Columbia	25	25	20	.....	.....	32	.....	.....	North Carolina	33	32	30	23	.....	35	22	26
Florida	39	38	38	.....	9	41	.....	33	North Dakota	40	42	39	23	.....	36	.....	.....
Georgia	17	22	18	23	.....	12	19	12	Ohio	4	4	4	4	2	7	4	1
Idaho	47	49	44	32	.....	.....	.....	.....	Oklahoma	48	48	47	.....	.....	43	.....	.....
Illinois	3	3	2	5	11	4	1	7	Oregon	29	30	29	27	.....	28	.....	34
Indiana	11	10	10	18	.....	10	8	10	Pennsylvania	2	2	3	3	3	2	3	3
Indian territory	50	50	48	.....	.....	.....	.....	.....	Rhode Island	34	24	40	33	.....	27	25	.....
Iowa	13	15	8	11	4	14	13	15	South Carolina	37	37	36	30	15	.....	17	29
Kansas	16	20	13	19	.....	19	24	28	South Dakota	35	40	33	20	.....	30	.....	24
Kentucky	18	13	17	8	5	24	.....	8	Tennessee	10	19	9	16	.....	16	6	16
Louisiana	23	21	22	15	.....	23	21	21	Texas	19	17	15	12	14	21	23	17
Maine	7	28	21	28	.....	3	20	5	Utah	42	34	49	9	.....	33	.....	20
Maryland	22	12	24	.....	.....	26	12	19	Vermont	30	41	35	.....	.....	17	.....	.....
Massachusetts	5	5	5	7	.....	5	5	4	Virginia	24	27	23	17	16	20	11	27
Michigan	8	8	7	14	7	9	14	13	Washington	31	26	31	.....	.....	31	.....	35
Minnesota	15	9	14	10	.....	13	20	6	West Virginia	36	33	34	34	.....	39	.....	32
Mississippi	38	44	37	.....	13	38	.....	25	Wisconsin	14	16	11	1	.....	22	10	9
Missouri	6	6	6	6	6	8	7	11	Wyoming	44	47	43	.....	.....	.....	.....	.....

The aggregate circulation per issue and the average number of inhabitants to each copy of the daily papers in each of the 28 cities that had a population of 100,000 and over, according to the census of 1890, is given in the following statement, the cities being arranged according to their rank in population. This statement also shows the rank of each city based upon the least number of inhabitants to each copy per issue.

STATISTICS RELATING TO DAILY PUBLICATIONS IN 28 PRINCIPAL CITIES: 1890. (a)

CITIES.	NUMBER OF DAILY PAPERS PUBLISHED.			Aggregate circulation per issue.	Population of cities, census of 1890.	Number of inhabitants to each copy per issue.	Rank of cities according to least number of inhabitants to each copy per issue.
	Total.	Morning.	Evening.				
New York, N. Y	50	34	16	1,698,553	1,515,301	0.89	1
Chicago, Ill	27	14	13	644,000	1,099,850	1.71	11
Philadelphia, Pa	24	13	11	804,008	1,046,964	1.30	6
Brooklyn, N. Y	5	.....	5	82,448	806,343	9.78	27
St. Louis, Mo	15	9	6	238,525	451,770	1.89	13
Boston, Mass	12	5	7	466,471	448,477	0.96	2
Baltimore, Md	7	6	1	133,510	434,439	3.25	22
San Francisco, Cal	21	14	7	286,912	298,997	1.04	5
Cincinnati, Ohio	14	10	4	213,500	296,908	1.39	7
Cleveland, Ohio	13	4	9	133,800	261,353	1.95	14
Buffalo, N. Y	10	3	7	120,800	255,664	2.12	17
New Orleans, La	9	4	5	73,900	242,039	3.28	23
Pittsburg, Pa	10	7	3	232,462	238,617	1.03	4
Washington, D. C	4	2	2	62,651	230,392	3.68	25
Detroit, Mich	8	2	6	134,388	205,876	1.53	8
Milwaukee, Wis	10	5	5	63,200	204,468	3.24	21
Newark, N. J	6	3	3	50,600	181,830	3.59	24
Minneapolis, Minn	9	4	5	92,323	164,738	1.78	12
Jersey city, N. J	4	1	3	28,300	163,003	5.76	26
Louisville, Ky	5	3	2	95,100	161,129	1.69	10
Omaha, Neb	8	2	6	60,329	140,452	2.33	19
Rochester, N. Y	7	2	5	65,276	133,896	2.05	16
St. Paul, Minn	7	3	4	67,850	133,156	1.96	15
Kansas city, Mo	9	6	3	130,700	132,716	1.02	3
Providence, R. I	3	1	2	52,000	132,146	2.54	20
Denver, Colo	5	3	2	48,000	106,713	2.22	18
Indianapolis, Ind	7	3	4	64,213	105,436	1.64	9
Allegheny, Pa. (b)	.....	.....	.....	.....	105,287	.....	.....

a This statement includes publications from which reports were not received, as follows:

New York, N. Y., 1 morning and 1 evening paper, with estimated circulation of 65,000
Philadelphia, Pa., 1 evening paper, with estimated circulation of 15,000
Brooklyn, N. Y., 1 evening paper, with estimated circulation of 15,000
Boston, Mass., 2 morning and 2 evening papers, with estimated circulation of 241,000
Cincinnati, Ohio, 1 morning paper, with estimated circulation of 58,000
Buffalo, N. Y., 1 evening paper, with estimated circulation of 41,000
Pittsburg, Pa., 2 morning papers, with estimated circulation of 47,000
Jersey city, N. J., 1 evening paper, with estimated circulation of 4,000
Rochester, N. Y., 1 evening paper, with estimated circulation of 12,000
Denver, Colo., 1 evening paper for which circulation is not shown.

b No daily papers in existence during census year 1890.

The above statement should not be considered as indicating the number of inhabitants in any city to the actual circulation in that city. For instance, the number of daily papers printed at each issue in New York city exceeds the population by 183,252, there being less than 1 person to each copy. The circulation per issue for Brooklyn is 723,895 less than the total population, there being nearly 10 persons to each copy. This apparent disproportion is caused by the large circulation in Brooklyn and elsewhere of the papers printed in New York city. Therefore the number of daily papers actually circulated in Brooklyn is considerably greater than that shown. No daily papers appear to have been printed in Allegheny, Pa., during the census year, and therefore no rank is given for that city. Pittsburg, the adjoining city, ranks number 4, there being but 1.03 inhabitants to each paper. It follows necessarily that the daily papers printed in Pittsburg circulate largely in Allegheny.

Data similar to that contained in the preceding statement was presented for 22 cities at the census of 1880. In the following statement the statistics for these 22 cities are placed in comparison:

COMPARATIVE STATEMENT, STATISTICS RELATING TO DAILY PUBLICATIONS IN 22 CITIES: 1880 AND 1890.

CITIES.	Year.	NUMBER OF DAILY PAPERS PUBLISHED.			Aggregate circulation per issue.	Population of cities.	Number of inhabitants to each copy per issue.	Rank of cities according to least number of inhabitants to each copy per issue.
		Total.	Morning.	Evening.				
New York, N. Y	1880	29	20	9	765,843	1,206,299	1.58	2
	1890	50	34	16	1,698,553	1,515,301	0.89	1
Chicago, Ill	1880	18	10	8	220,577	503,185	2.28	9
	1890	27	14	13	644,000	1,099,850	1.71	10
Philadelphia, Pa	1880	24	13	11	375,274	847,170	2.26	8
	1890	24	13	11	804,008	1,046,964	1.30	5
Brooklyn, N. Y	1880	4	.....	4	48,537	566,663	11.67	22
	1890	5	.....	5	82,448	806,343	9.78	22
St. Louis, Mo	1880	9	8	1	99,364	350,518	3.52	14
	1890	15	9	6	238,525	451,770	1.89	11
Boston, Mass	1880	11	6	5	221,315	362,839	1.64	4
	1890	12	5	7	466,471	448,477	0.96	2
Baltimore, Md	1880	9	6	3	128,643	332,313	2.58	10
	1890	7	6	1	133,510	434,439	3.25	17
San Francisco, Cal	1880	21	11	10	143,232	233,959	1.63	3
	1890	21	14	7	286,912	298,997	1.04	4
Cincinnati, Ohio	1880	12	8	4	117,549	255,139	2.17	7
	1890	14	10	4	213,500	296,908	1.39	6
Cleveland, Ohio	1880	8	2	6	48,730	160,146	3.29	12
	1890	13	4	9	133,800	261,353	1.95	12
Buffalo, N. Y	1880	7	2	5	26,100	155,134	5.94	19
	1890	10	3	7	120,800	255,664	2.12	14
New Orleans, La	1880	10	6	4	37,565	216,090	5.76	18
	1890	9	4	5	73,900	242,039	3.28	18
Pittsburg, Pa	1880	9	6	3	111,001	156,389	1.41	1
	1890	10	7	3	232,462	238,617	1.03	3
Washington, D. C	1880	5	3	2	34,500	147,293	4.27	15
	1890	4	2	2	62,651	230,392	3.68	20
Detroit, Mich	1880	6	3	3	41,533	116,340	2.80	11
	1890	8	2	6	134,388	205,876	1.53	7
Milwaukee, Wis	1880	7	4	3	24,300	115,587	4.76	16
	1890	10	5	5	63,200	204,468	3.24	16
Newark, N. J	1880	6	4	2	18,300	136,508	7.46	20
	1890	6	3	3	50,600	181,830	3.59	19
Jersey city, N. J	1880	2	.....	2	11,176	120,722	10.80	21
	1890	4	1	3	28,300	163,003	5.76	21
Louisville, Ky	1880	5	4	1	22,215	123,758	5.57	17
	1890	5	3	2	95,100	161,129	1.69	9
St. Paul, Minn	1880	6	3	3	19,893	41,473	2.08	5
	1890	7	3	4	67,850	133,156	1.96	13
Providence, R. I	1880	5	2	3	29,900	104,857	3.51	13
	1890	3	1	2	52,000	132,146	2.54	15
Indianapolis, Ind	1880	4	3	1	35,587	75,056	2.11	6
	1890	7	3	4	64,213	105,436	1.64	8

The number of inhabitants to each copy per issue for all classes of newspapers and periodicals in the different states and territories is given in the following statement, which also presents the total population and the aggregate circulation per issue for all classes of publications. The conditions governing the circulation and number of inhabitants to each copy issued for the daily papers in the principal cities apply to the statistics given in this statement, because there are certain cities known as newspaper and periodical centers, from which thousands of daily, weekly, and monthly publications are circulated outside the state in which the cities are located.

POPULATION, CIRCULATION, AND NUMBER OF INHABITANTS TO EACH COPY PER ISSUE, NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES: 1890.

STATES AND TERRITORIES.	Population, census of 1890.	Aggregate circulation per issue. (All classes of newspapers and periodicals.)	Number of inhabitants to each copy per issue.
The United States	62,622,250	69,138,934	a0.91
Alabama	1,513,017	246,847	6.13
Arizona	59,620	22,309	2.67
Arkansas	1,128,179	192,749	5.85
California	1,208,130	1,151,389	1.05
Colorado	412,198	229,669	1.79
Connecticut	746,258	496,084	1.50
Delaware	168,493	55,582	3.03
District of Columbia	230,392	321,151	0.72
Florida	391,422	107,257	3.65
Georgia	1,837,353	733,223	2.51
Idaho	84,385	21,270	3.97
Illinois	3,826,351	7,891,219	0.48
Indiana	2,192,404	1,299,418	1.69
Indian territory	b180,182	8,995	20.03
Iowa	1,911,896	1,088,019	1.76
Kansas	1,427,096	756,746	1.89
Kentucky	1,858,635	727,781	2.55
Louisiana	1,118,587	358,183	3.12
Maine	661,086	2,442,046	0.27
Maryland	1,042,390	392,068	2.66
Massachusetts	2,238,943	4,662,159	0.48
Michigan	2,093,889	1,511,915	1.38
Minnesota	1,301,826	1,023,005	1.27
Mississippi	1,289,600	108,061	11.93
Missouri	2,679,184	2,615,135	1.02
Montana	132,159	68,980	1.92
Nebraska	1,058,910	635,505	1.67
Nevada	45,761	14,530	3.15
New Hampshire	376,530	261,040	1.44
New Jersey	1,444,933	1,486,777	0.97
New Mexico	153,593	23,157	6.63
New York	5,997,853	18,031,391	0.33
North Carolina	1,617,947	178,077	9.09
North Dakota	182,719	86,425	2.11
Ohio	3,672,316	5,639,781	0.65
Oklahoma	61,834	14,654	4.22
Oregon	313,767	208,855	1.50
Pennsylvania	5,258,014	9,472,083	0.56
Rhode Island	345,506	148,868	2.32
South Carolina	1,151,149	121,672	9.46
South Dakota	328,808	142,362	2.31
Tennessee	1,767,518	1,450,118	1.22
Texas	2,235,523	658,183	3.40
Utah	207,905	68,000	3.06
Vermont	332,422	207,565	1.60
Virginia	1,655,980	346,056	4.79
Washington	349,390	204,488	1.71
West Virginia	762,794	130,328	5.85
Wisconsin	1,686,880	1,053,389	1.60
Wyoming	60,705	24,370	2.49

a Result including the population of Indian territory.

b Not included in total population of the United States.

GENERAL TABLES.

Tables 1, 2, 3, and 4 are comparative for the censuses of 1880 and 1890, the data being presented by totals for states and territories. Table 1 presents totals for the general items of inquiry common to the two censuses. Table 2 shows the aggregate and average circulation per issue for all classes of newspapers and periodicals, classified according to period of issue. Table 3 presents the number of newspapers and periodicals in existence during the respective census years, classified according to periods of issue and character of publication. Table 4 shows the different languages and the number of newspapers and periodicals published in each.

Table 5 is a detailed statement and presents the statistics relating to capital, miscellaneous expenses, employés, wages, materials, and products for newspaper and periodical establishments, as reported at the census of 1890, by states and territories.

Table 6 shows the number of newspapers and periodicals, grouped by periods of issue and character of publication, by states and territories. In this table the number of publications that neglected to furnish the information required for census purposes are shown separately under the head "Number of publications not reporting".

Table 7 presents statistics concerning circulation and consumption of paper. The average circulation per issue and the aggregate number of copies printed during the census year is shown, by states and territories, for all classes of newspapers and periodicals and for the different periods of issue; also the number of pounds of paper used for each edition.

Table 8 shows the number of newspapers and periodicals printed in different languages, by states and territories, and shows separately the number of publications that did not furnish the information required for census purposes.

TABLE 1.—COMPARATIVE STATEMENT, NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES: 1880 AND 1890.

STATES AND TERRITORIES.	Year.	NUMBER OF PUBLICATIONS.			AVERAGE NUMBER OF EMPLOYES AND TOTAL WAGES. (a)		Pounds of paper consumed.	VALUE OF PRODUCTS.			Aggregate circulation per issue.	Aggregate number of copies printed and circulated during census year.
		Total.	Reporting. (b)	Not reporting. (c)	Employés.	Wages.		Total. (d)	Advertising.	Subscriptions and sales.		
The United States..	1880	11,314	11,314	.....	71,615	$28,559,336	189,145,043	$89,009,074	$39,136,306	$49,872,768	31,779,686	2,067,848,209
	1890	17,616	14,901	2,715	106,095	68,601,582	552,876,161	143,586,448	71,243,361	72,343,087	69,138,934	4,681,113,530
Alabama	1880	125	125	.....	480	110,083	480,354	423,911	220,665	203,246	93,073	6,778,544
	1890	177	136	41	647	371,767	2,007,288	698,114	365,654	332,460	246,847	19,277,464
Arizona	1880	17	17	.....	107	45,828	105,048	95,700	58,000	37,700	13,550	1,413,600
	1890	35	29	6	124	83,091	189,620	114,630	59,680	54,950	22,309	2,551,928
Arkansas	1880	117	117	.....	488	119,048	383,857	340,103	182,201	157,902	103,501	4,990,595
	1890	193	164	29	624	322,742	1,083,505	461,261	232,376	228,885	192,749	13,768,353
California	1880	361	361	.....	2,349	1,300,140	6,375,390	3,936,238	2,150,917	1,785,321	640,026	72,861,836
	1890	535	455	100	3,405	2,800,243	20,229,809	5,595,605	3,099,453	2,496,152	1,151,389	163,716,618
Colorado	1880	87	87	.....	617	338,345	721,305	1,015,110	567,442	447,668	95,744	8,877,831
	1890	257	186	71	1,221	1,064,301	4,984,842	1,804,280	1,125,534	678,746	229,669	30,022,108
Connecticut	1880	139	139	.....	911	378,566	1,782,060	939,482	460,070	479,412	237,660	20,366,449
	1890	180	156	24	1,286	868,171	4,676,762	1,490,107	766,517	723,590	496,084	48,253,243
Dakota (e)	1880	67	67	.....	315	112,185	222,534	235,051	128,026	107,025	36,943	2,739,014
	1890	339	261	78	915	504,897	1,324,318	757,807	428,649	329,158	228,787	16,693,746
Delaware	1880	26	26	.....	190	55,279	344,864	156,088	91,983	64,105	34,425	5,172,998
	1890	41	32	9	215	108,150	580,218	169,646	105,316	64,330	55,582	8,033,402
District of Columbia	1880	44	44	.....	343	205,924	1,157,520	569,657	225,928	343,729	213,923	15,874,432
	1890	48	17	31	497	389,731	5,357,486	1,136,783	582,918	553,865	321,151	31,715,418
Florida	1880	45	45	.....	182	43,253	113,891	116,700	66,659	50,041	27,332	2,086,644
	1890	122	97	25	515	260,113	1,036,382	373,888	188,589	185,299	107,257	10,113,301
Georgia	1880	200	200	.....	1,084	331,327	1,530,830	948,629	468,511	480,118	269,066	20,994,549
	1890	279	230	49	1,415	760,724	7,028,445	1,633,286	838,034	795,252	733,223	48,512,208
Idaho	1880	10	10	.....	32	18,000	23,853	38,000	19,190	18,810	5,650	367,600
	1890	48	33	15	417	80,027	141,176	117,040	67,060	49,980	21,270	1,593,500
Illinois	1880	1,017	1,017	.....	6,583	2,736,717	15,649,893	7,264,585	3,179,954	4,084,631	2,421,275	174,696,505
	1890	1,416	1,241	175	9,502	6,431,079	60,907,589	13,525,673	7,072,055	6,453,618	7,891,219	465,924,592
Indiana	1880	467	467	.....	2,676	745,850	3,502,848	2,030,113	1,057,688	978,425	661,111	44,908,191
	1890	680	620	60	3,251	1,631,819	8,619,064	2,784,087	1,413,047	1,371,040	1,299,418	94,466,572
Indian territory (f)	1890	13	9	4	23	9,828	43,766	18,290	9,360	8,930	8,995	480,740
Indian territory, including Oklahoma. (g)	1880	3	3	.....	14	3,000	16,297	6,300	2,990	3,310	4,060	210,200
	1890	43	30	13	106	41,959	142,211	63,785	35,660	28,125	23,649	1,943,072
Iowa	1880	569	569	.....	2,637	647,407	2,765,927	2,088,170	1,150,806	937,364	547,340	35,747,302
	1890	804	703	101	3,576	1,744,480	7,809,310	2,670,693	1,371,817	1,298,876	1,088,019	80,780,202
Kansas	1880	347	347	.....	1,499	335,438	1,347,475	1,006,800	591,723	415,077	280,729	14,589,223
	1890	786	693	93	2,588	1,132,043	5,276,496	1,881,248	1,007,019	874,229	756,746	57,469,382
Kentucky	1880	205	205	.....	1,356	272,136	2,041,378	1,468,617	671,884	796,733	397,564	25,332,423
	1890	270	218	52	1,800	1,106,423	5,780,580	1,831,485	953,254	878,231	727,781	71,543,310
Louisiana	1880	112	112	.....	786	411,616	1,625,250	1,130,655	617,262	513,393	131,630	15,602,320
	1890	173	129	44	937	687,378	3,906,224	1,281,005	717,586	563,419	358,183	40,145,248
Maine	1880	123	123	.....	1,036	317,006	2,567,686	1,236,461	214,394	1,022,067	1,214,460	25,661,345
	1890	172	146	26	1,343	632,159	5,779,649	1,405,150	575,122	830,028	2,442,046	53,206,443
Maryland	1880	143	143	.....	1,163	486,958	3,983,128	1,567,893	859,847	708,046	414,693	50,115,183
	1890	170	124	46	1,251	846,819	6,477,706	1,739,705	1,039,291	700,414	392,068	56,855,415
Massachusetts	1880	427	427	.....	3,416	2,074,749	15,118,634	6,367,760	2,512,522	3,855,238	2,012,929	149,319,973
	1890	668	568	100	5,996	4,144,307	34,734,860	8,549,920	3,970,820	4,579,100	4,662,159	361,440,450
Michigan	1880	464	464	.....	2,439	729,673	4,648,339	2,057,438	1,002,092	1,055,346	620,974	46,659,470
	1890	657	589	68	3,668	1,824,744	11,680,577	3,274,089	1,711,309	1,562,780	1,511,915	122,904,401
Minnesota	1880	223	223	.....	1,178	390,161	1,545,303	947,903	524,540	423,363	222,074	18,097,781
	1890	445	392	53	2,630	1,707,637	10,193,158	3,153,605	1,639,136	1,514,469	1,023,005	95,554,359
Mississippi	1880	123	123	.....	468	109,036	426,012	380,893	211,934	168,959	87,904	5,293,418
	1890	161	119	42	384	158,038	493,593	279,025	139,576	139,449	108,061	7,266,809
Missouri	1880	530	530	.....	3,215	1,284,831	9,925,367	3,578,921	1,710,241	1,868,680	965,285	79,265,309
	1890	803	707	96	5,291	3,407,446	27,462,453	6,826,120	3,465,701	3,360,419	2,615,135	225,731,297
Montana	1880	18	18	.....	94	66,700	114,990	177,750	84,130	93,620	20,827	1,280,480
	1890	61	52	9	307	330,862	783,627	427,744	227,865	199,879	68,980	9,106,770
Nebraska	1880	189	189	.....	762	250,732	903,207	712,544	391,825	320,719	154,570	11,717,163
	1890	550	446	104	1,918	1,125,363	5,583,456	2,007,990	1,031,110	916,880	635,505	52,037,259
Nevada	1880	37	37	.....	202	162,338	354,444	338,800	215,139	123,661	27,745	5,820,575
	1890	25	15	10	63	58,725	158,962	93,209	51,835	41,374	14,530	3,010,210

a Includes for 1890 the employés engaged in the book and job printing branch of the industry and their wages.
b Includes for 1880, 1,182 publications, for which data concerning employés, wages, materials, products, or circulation were not reported.
c Publications that were in existence in 1890 from which returns were not received; this table therefore includes no data for them.
d For purposes of comparison the figures for 1890 do not include "Book and job printing" and "All other products", shown in the following tables.
e North and South Dakota combined for 1890 to compare with Dakota territory for 1880.
f See Indian territory, including Oklahoma.
g Indian territory and Oklahoma combined for 1890 to compare with Indian territory for 1880.

TABLE I.—COMPARATIVE STATEMENT, NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES, ETC.—Cont'd.

STATES AND TERRITORIES.	Year.	NUMBER OF PUBLICATIONS.			AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.		Pounds of paper consumed.	VALUE OF PRODUCTS.			Aggregate circulation per issue.	Aggregate number of copies printed and circulated during census year.
		Total.	Reporting.	Not reporting.	Employés.	Wages.		Total.	Advertising.	Subscriptions and sales.		
New Hampshire	1880	87	87	.....	412	$119,203	581,916	$350,859	$179,015	$180,844	185,968	9,635,410
	1890	127	111	16	651	317,764	1,911,461	544,786	263,253	281,533	261,040	21,314,338
New Jersey	1880	215	215	.....	1,364	454,533	1,698,173	1,175,015	694,157	480,858	219,478	22,150,095
	1890	318	263	55	2,199	1,365,376	6,447,571	2,234,291	1,201,280	1,033,011	1,486,777	75,855,311
New Mexico	1880	18	18	.....	79	31,292	56,352	70,972	35,883	35,089	6,355	838,860
	1890	41	34	7	140	88,833	160,834	152,480	78,230	74,250	23,157	2,524,262
New York	1880	1,411	1,411	.....	12,402	6,460,071	57,823,682	24,266,911	8,674,173	15,592,738	9,374,134	577,755,819
	1890	1,938	1,627	311	18,080	14,933,132	165,413,361	37,842,822	17,861,315	19,981,507	18,031,391	1,177,147,744
North Carolina	1880	142	142	.....	502	119,809	460,590	344,132	178,324	165,808	105,501	6,819,382
	1890	176	135	41	567	236,590	1,111,101	440,710	211,733	228,977	178,077	14,821,936
North Dakota (a)	1890	112	87	25	337	203,352	510,604	307,392	179,216	128,176	86,425	6,357,508
Ohio	1880	774	774	.....	5,313	1,761,038	11,065,159	6,109,448	2,460,642	3,648,806	3,093,931	152,579,380
	1890	1,093	932	161	7,292	4,063,564	29,823,811	8,360,115	3,850,306	4,509,809	5,039,781	306,568,217
Oklahoma (b)	1890	30	21	9	83	32,131	98,445	45,495	26,300	19,195	14,654	1,402,332
Oregon	1880	74	74	.....	343	128,430	709,836	367,189	177,095	190,094	85,786	8,578,213
	1890	137	126	11	700	556,889	2,150,770	951,827	544,328	407,499	208,855	19,159,764
Pennsylvania	1880	973	973	.....	7,238	2,913,162	28,026,402	9,319,497	4,218,770	5,100,727	5,031,061	297,559,892
	1890	1,476	1,271	205	10,658	6,567,603	71,130,406	16,380,582	7,345,234	9,035,348	9,472,083	633,014,599
Rhode Island	1880	44	44	.....	443	206,526	123,745	455,726	214,155	211,571	97,121	14,496,498
	1890	72	54	18	579	374,894	3,135,927	727,040	443,901	283,139	148,868	26,228,741
South Carolina	1880	81	81	.....	393	110,081	432,478	309,238	145,907	163,331	69,902	5,774,415
	1890	100	84	16	449	237,385	1,007,108	445,661	212,081	233,580	121,672	11,248,784
South Dakota (a)	1890	227	174	53	578	301,545	813,714	450,415	249,433	200,982	142,362	10,336,238
Tennessee	1880	193	193	.....	901	265,456	1,423,483	784,081	373,450	410,631	293,288	18,293,872
	1890	254	219	35	1,357	827,531	5,185,720	1,479,767	737,741	742,026	1,450,118	72,094,743
Texas	1880	280	280	.....	1,457	772,059	1,791,588	1,100,295	570,089	530,206	263,289	19,883,792
	1890	512	437	75	1,995	1,193,550	5,345,193	2,212,990	1,263,338	949,652	658,183	55,640,136
Utah	1880	22	22	.....	168	88,580	321,039	177,058	81,270	95,788	36,175	3,867,500
	1890	39	28	11	378	279,277	1,206,050	483,555	271,770	211,785	68,000	9,626,740
Vermont	1880	82	82	.....	371	92,959	538,301	262,719	102,619	160,100	130,192	5,681,464
	1890	76	70	6	403	208,694	996,377	322,160	141,027	181,133	207,565	9,189,590
Virginia	1880	194	194	.....	961	261,362	1,352,930	698,826	356,204	342,622	256,471	18,422,845
	1890	231	185	46	899	442,131	1,977,387	818,073	424,255	393,818	346,056	28,172,077
Washington	1880	29	29	.....	109	34,975	76,968	87,400	48,840	38,560	16,751	1,002,103
	1890	172	144	28	797	683,827	2,615,931	1,149,285	759,784	389,501	204,488	23,547,244
West Virginia	1880	109	109	.....	511	99,671	378,670	301,411	169,280	132,131	85,958	4,903,466
	1890	144	112	32	532	222,052	1,080,543	389,257	188,351	200,906	130,328	12,428,686
Wisconsin	1880	340	340	.....	1,980	531,903	2,428,546	1,589,725	754,920	834,805	436,576	27,901,051
	1890	521	456	65	2,728	1,285,724	7,574,249	2,354,825	1,015,423	1,339,402	1,053,389	86,422,737
Wyoming	1880	11	11	.....	46	25,900	77,506	47,300	32,950	14,350	5,686	803,260
	1890	31	25	6	93	82,518	172,995	149,242	88,028	61,214	24,370	2,473,860

a See Dakota.

b See Indian territory including Oklahoma.

TABLE 2.—COMPARATIVE STATEMENT AVERAGE AND AGGREGATE CIRCULATION PER ISSUE, CLASSIFIED

	STATES AND TERRITORIES.	Year.	AVERAGE CIRCULATION PER ISSUE. All classes.	Daily.	Weekly.	Semiweekly.	Triweekly.	Monthly.	Quarterly.	All other.
1	The United States	1880	3,122	4,137	2,113	2,136	1,001	7,834	16,505	6,474
2		1890	4,640	5,203	2,678	2,896	1,473	11,317	36,109	11,851
3	Alabama	1880	862	1,932	778	.....	200	1,175	.....	1,500
4		1890	1,815	2,297	1,606	1,500	.....	974	14,500	975
5	Arizona	1880	968	720	1,106	.....	.....	.....	.....	.....
6		1890	769	651	814	.....	.....	.....	.....	.....
7	Arkansas	1880	1,067	1,006	927	1,500	.....	500	.....	5,283
8		1890	1,175	1,137	1,172	.....	.....	1,393	.....	600
9	California	1880	2,006	3,288	1,580	2,071	2,750	3,064	1,725	1,425
10		1890	2,531	4,591	1,942	619	375	3,236	7,000	1,650
11	Colorado	1880	1,294	1,884	1,070	600	.....	2,475	.....	.....
12		1890	1,235	2,963	842	720	1,300	4,875	.....	.....
13	Connecticut	1880	1,917	2,968	1,737	850	.....	2,583	700	794
14		1890	3,189	3,448	1,921	745	.....	9,264	4,500	1,275
15	Dakota (c)	1880	616	562	612	.....	.....	.....	.....	.....
16		1890	877	886	797	880	.....	1,854	.....	4,000
17	Delaware	1880	1,434	3,950	928	.....	.....	1,000	.....	.....
18		1890	1,737	4,090	1,310	.....	.....	1,250	.....	.....
19	District of Columbia	1880	5,485	9,125	5,535	.....	.....	4,747	1,050	.....
20		1890	18,891	15,663	22,136	.....	.....	7,500	.....	.....
21	Florida	1880	739	1,300	719	500	.....	.....	.....	.....
22		1890	1,106	1,384	1,088	.....	500	2,000	.....	300
23	Georgia	1880	1,259	2,141	1,069	1,100	600	3,706	.....	700
24		1890	3,188	3,713	2,499	2,000	.....	6,166	3,000	12,200
25	Idaho	1880	628	.....	664	500	500	.....	.....	.....
26		1890	645	567	668	440	.....	.....	.....	.....
27	Illinois	1880	2,551	3,955	2,269	1,713	1,085	4,463	1,500	2,478
28		1890	6,359	6,401	4,007	1,541	450	8,941	64,407	5,252
29	Indiana	1880	1,552	1,913	1,464	2,250	858	2,410	.....	979
30		1890	2,096	1,805	1,504	1,420	.....	6,097	4,867	5,056
31	Indian territory (d)	1880	999	500	1,062	.....	.....	.....	.....	.....
32	Indian territory, including Oklahoma. (e)	1880	2,030	.....	2,030	.....	.....	.....	.....	.....
33		1890	788	564	845	.....	.....	1,100	.....	.....
34	Iowa	1880	1,071	1,479	997	633	200	1,990	3,000	832
35		1890	1,548	2,404	1,341	1,028	2,400	3,411	3,188	3,480
36	Kansas	1880	961	1,528	878	1,800	.....	1,871	.....	1,200
37		1890	1,092	1,913	960	827	.....	3,317	700	743
38	Kentucky	1880	2,184	3,045	1,743	1,141	900	1,272	.....	42,850
39		1890	3,338	5,406	2,700	2,886	3,300	2,265	.....	13,456
40	Louisiana	1880	1,330	3,460	969	8,000	1,000	475	.....	2,200
41		1890	2,777	6,550	2,282	5,200	.....	3,123	1,700	2,067
42	Maine	1880	11,041	1,894	1,962	.....	480	60,953	1,500	400
43		1890	16,726	2,770	2,621	1,350	.....	54,574	1,000	50,463
44	Maryland	1880	3,166	9,472	2,508	.....	.....	1,976	900	1,413
45		1890	3,162	12,462	2,062	.....	.....	3,679	6,925	2,916
46	Massachusetts	1880	5,122	7,789	4,273	2,671	400	7,870	3,157	1,406
47		1890	8,208	7,960	5,363	3,634	.....	10,795	25,223	18,611
48	Michigan	1880	1,465	2,167	1,347	1,322	2,083	1,958	6,875	1,707
49		1890	2,567	4,096	1,843	1,338	1,700	7,709	10,552	3,611
50	Minnesota	1880	1,116	3,562	909	.....	750	5,030	.....	475
51		1890	2,610	6,014	1,667	15,000	.....	3,546	1,000	26,346
52	Mississippi	1880	806	840	773	400	733	2,033	.....	.....
53		1890	908	1,225	894	.....	500	859	.....	1,018
54	Missouri	1880	2,041	3,228	1,750	1,100	1,165	3,418	800	2,823
55		1890	3,699	5,285	2,610	4,100	1,305	8,558	15,056	2,566
56	Montana	1880	1,388	304	1,660	.....	.....	.....	.....	.....
57		1890	1,327	2,130	1,209	1,250	960	617	.....	1,000
58	Nebraska	1880	888	1,553	791	500	.....	2,173	.....	600
59		1890	1,425	2,732	1,134	450	.....	7,623	.....	2,614
60	Nevada	1880	841	1,225	561	.....	.....	509	.....	.....
61		1890	969	1,450	648	.....	.....	.....	.....	.....
62	New Hampshire	1880	2,296	907	1,800	.....	.....	5,614	.....	7,400
63		1890	2,352	2,369	2,451	725	.....	1,994	.....	.....
64	New Jersey	1880	1,306	2,116	1,112	900	750	1,811	6,000	517
65		1890	5,653	3,420	1,499	2,200	650	49,348	1,042	1,433
66	New Mexico	1880	530	667	484	.....	.....	.....	.....	.....
67		1890	681	1,284	604	.....	.....	.....	.....	500

a Includes a circulation of 150,000 not reported separately, distributed as follows: Georgia, 1 weekly, 1 semiweekly, and 1 monthly, circulation 50,000; Illinois, 4 weeklies, 13 monthlies, and 12 quarterlies, circulation 100,000.

b Includes 6 semiannual publications having a circulation of 19,750, distributed as follows: Illinois, 1; Michigan, 1; New York, 3, and Pennsylvania, 1.

ACCORDING TO PERIODS OF ISSUE, NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES: 1880 AND 1890.

AGGREGATE CIRCULATION PER ISSUE.								
All classes.	Dailies.	Weeklies.	Semiweeklies.	Triweeklies.	Monthlies.	Quarterlies.	All other.	
a11,779,686	3,566,395	16,266,830	264,910	68,086	8,139,881	b1,964,049	1,359,535	1
69,138,934	8,387,188	28,954,515	561,743	50,067	19,624,038	8,124,500	3,436,883	2
93,073	9,660	73,163	.....	200	7,050	.....	3,000	3
246,847	32,154	173,477	1,500	.....	8,766	29,000	1,950	4
13,550	3,600	9,950	.....	.....	.....	.....	.....	5
22,309	5,210	17,099	.....	.....	.....	.....	.....	6
103,501	5,030	80,621	1,500	.....	500	.....	15,850	7
192,749	15,917	166,482	.....	.....	9,750	.....	600	8
640,026	157,814	345,962	20,710	5,500	98,040	3,450	8,550	9
1,151,389	399,454	604,050	6,810	750	123,425	7,000	9,900	10
95,744	26,375	58,869	600	.....	9,900	.....	.....	11
229,669	68,150	128,809	2,160	1,300	29,250	.....	.....	12
237,660	47,490	152,895	1,700	.....	31,000	1,400	3,175	13
496,084	117,246	182,472	1,490	.....	185,276	4,500	5,100	14
36,943	4,500	32,443	.....	.....	.....	.....	.....	15
228,787	23,032	171,405	4,400	.....	25,950	.....	4,000	16
34,425	15,800	17,625	.....	.....	1,000	.....	.....	17
55,582	20,450	30,132	.....	.....	5,000	.....	.....	18
213,923	36,500	105,162	.....	.....	71,211	1,050	.....	19
321,151	62,651	243,500	.....	.....	15,000	.....	.....	20
27,332	2,600	23,732	1,000	.....	.....	.....	.....	21
107,257	16,605	87,052	.....	1,000	2,600	.....	600	22
a269,066	27,830	150,686	3,300	1,800	33,350	.....	2,100	23
733,223	70,546	442,250	2,000	.....	178,827	3,000	36,600	24
5,650	.....	4,650	500	500	.....	.....	.....	25
21,270	1,700	18,690	880	.....	.....	.....	.....	26
a2,421,275	270,923	1,527,042	29,129	6,510	401,646	31,500	54,525	27
7,801,219	774,486	3,437,663	30,820	900	1,627,250	1,867,800	152,300	28
661,111	72,698	518,322	2,250	1,716	60,250	.....	5,875	29
1,299,418	166,051	673,798	2,840	.....	371,909	29,200	55,620	30
8,995	500	8,495	.....	.....	.....	.....	.....	31
4,060	.....	4,060	.....	.....	.....	.....	.....	32
23,649	3,950	18,599	.....	.....	1,100	.....	.....	33
547,340	38,455	449,550	1,900	200	51,740	3,000	2,495	34
1,088,019	110,563	795,077	14,397	4,800	133,032	12,750	17,400	35
280,729	21,396	230,141	1,800	.....	26,192	.....	1,200	36
756,746	82,266	596,089	2,480	.....	72,983	700	2,228	37
397,564	33,492	240,473	6,844	1,800	29,255	.....	85,700	38
727,781	135,150	445,485	20,200	3,300	29,451	.....	94,195	39
131,630	38,065	81,415	8,000	1,000	950	.....	2,200	40
358,183	78,600	225,883	5,200	.....	40,600	1,700	6,200	41
1,214,460	18,940	156,940	.....	480	1,036,200	1,500	400	42
2,442,046	41,545	230,642	1,350	.....	1,964,659	2,000	201,850	43
414,693	132,613	255,770	.....	.....	19,760	900	5,650	44
392,068	137,085	210,310	.....	.....	22,075	13,850	8,748	45
2,012,929	280,399	1,089,515	34,727	400	574,538	22,100	11,250	46
4,662,159	445,781	1,802,125	25,440	.....	1,327,740	781,910	279,163	47
620,974	62,839	488,927	3,965	6,250	33,293	13,750	11,950	48
1,511,915	212,975	869,764	6,690	1,700	377,734	10,552	32,500	49
222,074	28,493	167,206	.....	750	25,150	.....	475	50
1,023,005	180,433	518,563	15,000	.....	148,933	2,000	158,076	51
87,904	4,200	75,004	400	2,200	6,100	.....	.....	52
108,061	7,350	91,206	.....	500	5,950	.....	3,055	53
965,285	122,660	645,747	1,100	10,120	153,800	800	31,058	54
2,615,135	428,094	1,346,714	28,700	2,610	624,767	135,500	48,750	55
20,827	912	19,915	.....	.....	.....	.....	.....	56
68,980	19,170	44,750	1,250	960	1,850	.....	1,000	57
154,570	18,630	121,800	500	.....	13,040	.....	600	58
635,505	84,698	447,757	900	.....	83,850	.....	18,300	59
27,745	17,155	10,090	.....	.....	500	.....	.....	60
14,530	8,700	5,830	.....	.....	.....	.....	.....	61
185,968	9,070	107,998	.....	.....	39,300	.....	29,600	62
261,040	37,900	201,752	1,450	.....	19,938	.....	.....	63
249,478	50,776	164,502	3,600	750	16,300	12,000	1,550	64
1,486,777	160,746	278,791	2,200	1,300	1,036,315	3,125	4,300	65
6,355	2,000	4,355	.....	.....	.....	.....	.....	66
23,157	5,134	17,523	.....	.....	.....	.....	500	67

c North and South Dakota combined for 1890 to compare with Dakota territory for 1880.
d See Indian territory, including Oklahoma
e Indian territory and Oklahoma combined for 1890 to compare with Indian territory for 1880.

TABLE 2.—COMPARATIVE STATEMENT, AVERAGE AND AGGREGATE CIRCULATION PER ISSUE, CLASSIFIED ACCORDING

	STATES AND TERRITORIES.	Year.	AVERAGE CIRCULATION PER ISSUE.							
			All classes.	Daily.	Weekly.	Semiweekly.	Triweekly.	Monthly.	Quarterly.	All other.
68	New York	1880	7,222	9,059	5,265	4,371	1,128	11,040	19,736	5,840
69		1890	11,083	13,081	6,848	3,258	3,638	17,697	34,943	12,649
70	North Carolina	1880	894	793	878	700	375	1,125	.....	1,303
71		1890	1,319	1,156	1,371	667	.....	1,810	500	1,275
72	North Dakota (a)	1890	993	1,317	897	1,000	.....	2,200	.....	.....
73	Ohio	1880	4,345	4,507	2,450	1,563	838	7,880	51,109	17,589
74		1890	6,051	4,130	3,144	2,328	1,404	9,024	53,720	41,584
75	Oklahoma (b)	1890	698	575	722	.....	.....	1,100	.....	.....
76	Oregon	1880	1,320	1,581	1,133	.....	.....	2,555	1,600	.....
77		1890	1,658	2,045	1,542	1,400	.....	2,500	.....	500
78	Pennsylvania	1880	5,628	6,285	3,255	4,600	1,500	10,926	29,180	20,096
79		1890	7,452	8,682	4,067	5,006	1,900	10,390	43,912	16,726
80	Rhode Island	1880	2,490	5,175	1,984	700	.....	1,013	.....	400
81		1890	2,757	7,551	1,989	425	.....	1,574	350	.....
82	South Carolina	1880	971	1,937	959	500	450	555	700	.....
83		1890	1,448	2,854	1,341	463	200	.....	3,500	2,000
84	South Dakota (a)	1890	818	727	745	800	.....	1,715	.....	4,000
85	Tennessee	1880	1,822	3,099	1,714	850	.....	2,385	2,450	1,223
86		1890	6,622	4,608	4,474	2,070	.....	4,929	82,583	3,213
87	Texas	1880	1,145	1,262	938	725	600	5,504	.....	650
88		1890	1,506	2,074	1,358	1,207	480	2,831	1,000	10,000
89	Utah	1880	1,904	1,987	1,707	2,050	.....	1,525	.....	3,500
90		1890	2,429	2,281	1,367	2,868	.....	3,000	.....	3,600
91	Vermont	1880	2,245	1,050	1,492	.....	.....	17,167	1,100	285
92		1890	2,965	2,140	1,729	.....	.....	13,800	.....	.....
93	Virginia	1880	1,449	1,892	1,073	699	740	2,363	1,767	6,308
94		1890	1,871	2,243	1,632	620	192	3,127	5,833	1,250
95	Washington	1880	698	367	745	.....	.....	.....	.....	.....
96		1890	1,420	2,720	1,179	.....	.....	2,279	.....	450
97	West Virginia	1880	868	2,050	852	625	500	961	1,000	150
98		1890	1,164	2,511	1,065	250	.....	1,100	.....	425
99	Wisconsin	1880	1,404	1,856	1,230	700	1,267	1,814	.....	4,138
100		1890	2,310	2,289	1,762	44,368	.....	2,586	6,875	8,305
101	Wyoming	1880	632	662	617	.....	.....	.....	.....	.....
102		1890	975	924	988	.....	.....	.....	.....	.....

a See Dakota.

TO PERIODS OF ISSUE, NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

AGGREGATE CIRCULATION PER ISSUE.								
All classes.	Dailies.	Weeklies.	Semiweeklies.	Triweeklies.	Monthlies.	Quarterlies.	All other.	
9,374,134	996,561	4,253,908	100,544	4,510	2,903,527	828,913	286,171	68
18,031,391	2,119,101	6,347,827	100,998	14,550	6,990,400	1,712,200	746,315	69
105,501	7,934	83,437	1,400	750	6,750	.....	5,230	70
178,077	23,110	139,867	2,000	.....	9,050	1,500	2,550	71
86,425	9,220	66,405	2,000	.....	8,800	.....	.....	72
3,093,931	216,336	1,328,133	6,250	6,700	622,531	562,200	351,781	73
5,639,781	499,712	1,906,400	44,230	9,825	956,522	1,342,997	790,095	74
14,654	3,450	10,104	.....	.....	1,100	.....	.....	75
85,786	11,070	57,786	.....	.....	15,330	1,600	.....	76
208,855	32,712	154,243	1,400	.....	20,000	.....	500	77
5,031,061	578,227	1,998,340	13,800	6,000	1,606,073	466,886	361,725	78
9,472,083	1,241,514	3,135,664	65,078	5,700	2,763,798	1,624,741	635,588	79
97,121	41,402	51,579	700	.....	3,040	.....	400	80
148,868	67,959	59,666	425	.....	20,468	350	.....	81
69,902	7,750	58,492	500	1,350	1,110	700	.....	82
121,672	17,125	97,922	925	200	.....	3,500	2,000	83
142,362	13,812	105,000	2,400	.....	17,150	.....	4,000	84
293,288	30,995	224,503	1,700	.....	23,850	4,900	7,340	85
1,450,118	82,941	756,105	4,140	.....	98,582	495,500	12,850	86
263,289	30,297	180,102	1,450	600	49,540	.....	1,300	87
658,183	87,123	498,557	7,240	480	53,783	1,000	10,000	88
36,175	7,950	11,950	8,200	.....	4,575	.....	3,500	89
68,000	20,525	8,200	20,075	.....	12,000	.....	7,200	90
130,192	4,200	73,107	.....	.....	51,500	1,100	285	91
207,565	10,700	100,265	.....	.....	96,600	.....	.....	92
256,471	32,172	121,281	4,101	3,700	70,902	5,300	18,925	93
346,056	47,106	218,748	3,720	192	56,290	17,500	2,500	94
16,751	1,100	15,651	.....	.....	.....	.....	.....	95
204,488	48,954	139,134	.....	.....	15,950	.....	450	96
85,958	4,100	74,152	1,250	500	4,806	1,000	150	97
130,328	22,600	101,128	250	.....	5,500	.....	850	98
436,576	33,400	316,179	1,400	3,800	36,282	.....	45,515	99
1,053,389	107,594	657,300	133,105	.....	51,715	20,625	83,050	100
5,686	1,986	3,700	.....	.....	.....	.....	.....	101
24,370	4,620	19,750	.....	.....	.....	.....	.....	102

b See Indian territory, including Oklahoma.

TABLE 3.—COMPARATIVE STATEMENT, PERIODS OF ISSUE AND CHARACTER OF

	STATES AND TERRITORIES.	Year.	Total number of publications.	PERIODS OF ISSUE. Number published.								
				Daily.			Weekly.	Semi-weekly.	Triweekly.	Monthly.	Quarterly.	All other.
				Total.	Morning.	Evening.						
1	The United States	1880	11,314	971	438	533	8,633	133	73	1,167	116	221
2		1890	17,616	1,731	599	1,132	12,721	214	40	2,247	271	392
3	Alabama	1880	125	6	3	3	109	.....	1	7	.....	2
4		1890	177	16	9	7	143	1	.....	11	2	4
5	Arizona	1880	17	6	3	3	11	.....	.....	.....	.....	.....
6		1890	35	9	6	3	26	.....	.....	.....	.....	.....
7	Arkansas	1880	117	6	2	4	104	1	.....	2	.....	4
8		1890	193	14	4	10	168	2	.....	8	.....	1
9	California	1880	361	58	30	28	250	11	2	32	2	6
10		1890	555	96	45	51	380	12	2	54	1	10
11	Colorado	1880	87	19	12	7	63	1	.....	4	.....	.....
12		1890	257	28	11	17	207	3	1	17	.....	1
13	Connecticut	1880	139	17	7	10	99	2	.....	15	2	4
14		1890	180	35	12	23	111	2	1	25	1	5
15	Dakota (*b*)	1880	67	9	4	5	57	1	.....	.....	.....	.....
16		1890	339	28	11	17	287	5	.....	18	.....	1
17	Delaware	1880	26	5	2	3	20	.....	.....	1	.....	.....
18		1890	41	5	2	3	31	.....	.....	5	.....	.....
19	District of Columbia	1880	44	5	3	2	23	.....	.....	15	1	.....
20		1890	48	4	2	2	29	.....	.....	11	2	2
21	Florida	1880	45	3	3	.....	40	2	.....	.....	.....	.....
22		1890	122	14	6	8	101	.....	2	3	.....	2
23	Georgia	1880	200	16	11	5	163	3	4	11	.....	3
24		1890	279	24	16	8	210	1	.....	39	1	4
25	Idaho	1880	10	.....	.....	.....	7	2	1	.....	.....	.....
26		1890	48	3	2	1	43	2	.....	.....	.....	.....
27	Illinois	1880	1,017	74	30	44	758	17	6	118	21	23
28		1890	1,416	125	44	81	968	21	2	225	33	42
29	Indiana	1880	467	40	12	28	390	1	3	27	.....	6
30		1890	680	97	18	79	489	3	.....	74	6	11
31	Indian territory (*c*)	1890	13	1	1	.....	12	.....	.....	.....	.....	.....
32	Indian territory, including Oklahoma. (*d*)	1880	3	.....	.....	.....	3	.....	.....	.....	.....	.....
33		1890	43	8	4	4	34	.....	.....	1	.....	.....
34	Iowa	1880	569	30	12	18	500	3	1	31	1	3
35		1890	804	49	18	31	675	15	2	52	4	7
36	Kansas	1880	347	20	8	12	310	1	.....	15	.....	1
37		1890	786	45	12	33	701	3	.....	29	1	7
38	Kentucky	1880	205	11	7	4	160	7	2	23	.....	2
39		1890	270	27	12	15	208	8	1	19	.....	7
40	Louisiana	1880	112	13	8	5	94	1	1	2	.....	1
41		1890	173	14	8	6	140	1	.....	13	1	4
42	Maine	1880	123	12	4	8	90	.....	1	18	1	1
43		1890	172	17	6	11	101	2	.....	44	3	5
44	Maryland	1880	143	15	10	5	111	.....	.....	12	1	4
45		1890	170	13	9	4	128	.....	.....	18	5	6
46	Massachusetts	1880	427	39	16	23	279	13	1	80	7	8
47		1890	668	60	12	48	373	7	.....	168	37	23
48	Michigan	1880	464	33	13	20	397	3	3	19	1	8
49		1890	657	53	12	41	522	5	2	60	1	14
50	Minnesota	1880	223	10	4	6	205	.....	1	6	.....	1
51		1890	445	30	11	19	355	1	.....	49	2	8
52	Mississippi	1880	123	5	3	2	109	1	5	3	.....	.....
53		1890	161	7	3	4	139	.....	3	9	.....	3
54	Missouri	1880	530	43	22	21	415	2	8	50	1	11
55		1890	803	83	28	55	585	7	2	88	13	25
56	Montana	1880	18	4	4	.....	14	.....	.....	.....	.....	.....
57		1890	61	10	4	6	42	2	1	4	.....	2
58	Nebraska	1880	189	15	5	10	165	1	.....	7	.....	1
59		1890	550	37	9	28	486	2	.....	17	.....	8
60	Nevada	1880	37	14	5	9	22	.....	.....	1	.....	.....
61		1890	25	10	3	7	15	.....	.....	.....	.....	.....

a For purposes of comparison 1880 includes 217 children's publications and Sunday school papers, and 1890, 173 Sunday publications (not connected with daily newspapers).

b North and South Dakota combined for 1890 to compare with Dakota territory for 1880.

PUBLICATION, NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES: 1880 AND 1890.

CHARACTER OF PUBLICATION. Number devoted to—												
News, politics and family reading.	Religion.	Agricultural, horticultural, dairy, and stock raising.	Commerce, finance, insurance, railroads, and trade.	General literature, including magazines.	Medicine and surgery.	Law.	Science and mechanics.	Freemasonry, Odd Fellowship, and temperance.	Education and history, including college and school publications.	Society, art, music, and fashion.	Miscellaneous. (a)	
8,863	553	173	363	189	114	45	68	149	248	72	477	1
13,147	1,182	312	778	387	187	51	123	277	396	198	578	2
114	5	2				1			3			3
149	14	4	1	1	1		2	1	2		2	4
17												5
31		3									1	6
106	5	2		1	1		1				1	7
176	8	1			1		1	3	2		1	8
270	12	7	27	4	3	3	3	7	6	3	16	9
428	20	14	35	10	5	1	3	9	5	3	22	10
78	2	1	1				2	1	1		1	11
218	6	3	10	3	2		3	4	1	2	5	12
110	3	4		2	1		1	5	11		2	13
133	11	5	4	8	1		3	1	8	1	5	14
67												15
317	6	2	1	1				1	10		1	16
24	1								1			17
31	2	1							2	1	4	18
20			2	2	1	2	1	3	2		11	19
20	1	1	4			3	4	3	1	1	10	20
41		2	1	1								21
105	4	4	4					1	2	1	1	22
177	7	4		2	3			1		1	5	23
222	14	5	5	3	6		2	1	11	3	7	24
10												25
47			1									26
736	49	15	66	9	8	5	5	13	19	7	85	27
950	114	31	111	35	19	5	20	23	19	20	69	28
422	13	7	3		2		2	6	9		3	29
553	32	22	18	1	7		2	9	14	2	20	30
11	1										1	31
3												32
40	2										1	33
519	15	4		2		1	1	7	15	1	4	34
707	31	7	8	3	2			15	17	4	10	35
322	4	5		2	1			3	3		7	36
724	11	9	5	1	1			7	14	4	10	37
162	13	6	4	3	4			2	5		6	38
218	20	4	9	1	3	1		1	7		6	39
96	7	1	1		1			1	1		4	40
127	11	6	8		2		1	2	3		13	41
91	9	4	1	8			3	2	3		3	42
112	8	7	2	24				4	8	3	4	43
105	10	5	5	3	2	1	1	3	4		4	44
129	11	4	6	2	3		2	1	3	1	8	45
281	30	6	19	20	2	2	5	6	15	10	31	46
353	86	15	38	42	7	2	14	19	33	15	44	47
413	11	5	3	1	7		2	5	9	3	5	48
542	39	10	9	7	7	1	1	11	14	3	13	49
207	3	3	2					2	2		4	50
355	22	7	14	10	2	2	3	6	8	4	12	51
115	4	3							1			52
143	8	4		1				1	4			53
425	28	7	17	5	8	3	2	9	11	2	13	54
593	63	16	53	9	19	4	4	6	13	7	16	55
17		1										56
50	3	5	1								2	57
178	2	3	1	2					2		1	58
510	5	8	8	2	3			3	4	2	5	59
35							2					60
25												61

c See Indian territory, including Oklahoma.
d Indian territory and Oklahoma combined for 1890 to compare with Indian territory for 1880.

TABLE 3.—COMPARATIVE STATEMENT, PERIODS OF ISSUE AND CHARACTER OF PUBLICATION,

	STATES AND TERRITORIES.	Year.	Total number of publications.	PERIODS OF ISSUE. Number published.								
				Daily.			Weekly.	Semi-weekly.	Triweekly.	Monthly.	Quarterly.	All other.
				Total.	Morning.	Evening.						
62	New Hampshire	1880	87	10	2	8	66	.....	.....	7	.....	4
63		1890	127	20	4	16	90	4	.....	12	.....	1
64	New Jersey	1880	215	27	8	19	163	6	1	13	2	3
65		1890	318	48	16	32	231	1	2	27	4	5
66	New Mexico	1880	18	3	2	1	15	.....	.....	.....	.....	.....
67		1890	41	4	1	3	36	.....	.....	.....	.....	1
68	New York	1880	1,411	115	46	69	892	24	5	282	40	53
69		1890	1,938	168	66	102	1,075	34	8	517	66	74
70	North Carolina	1880	142	13	7	6	113	3	2	7	.....	4
71		1890	176	21	9	12	135	3	.....	9	3	5
72	North Dakota (a)	1890	112	7	3	4	98	2	.....	5	.....	.....
73	Ohio	1880	774	56	22	34	584	4	8	90	11	21
74		1890	1,093	125	28	97	738	19	7	151	25	28
75	Oklahoma (b)	1890	30	7	3	4	22	.....	.....	1	.....	.....
76	Oregon	1880	74	7	4	3	59	.....	.....	6	1	1
77		1890	137	16	7	9	109	1	.....	10	.....	1
78	Pennsylvania	1880	973	98	42	56	674	3	4	159	16	19
79		1890	1,476	164	52	112	901	14	3	305	43	46
80	Rhode Island	1880	44	8	2	6	31	1	.....	3	.....	1
81		1890	72	10	3	7	42	2	1	15	1	1
82	South Carolina	1880	81	4	3	1	69	1	3	3	1	.....
83		1890	100	6	4	2	85	2	1	3	2	1
84	South Dakota (a)	1890	227	21	8	13	189	3	.....	13	.....	1
85	Tennessee	1880	193	12	7	5	154	2	.....	16	2	7
86		1890	254	19	8	11	196	2	.....	27	6	4
87	Texas	1880	280	30	14	16	231	2	1	14	.....	2
88		1890	512	44	15	29	433	6	1	23	1	1
89	Utah	1880	22	5	2	3	8	4	.....	4	.....	1
90		1890	39	9	4	5	10	9	.....	8	.....	3
91	Vermont	1880	82	5	2	3	72	.....	.....	3	1	1
92		1890	76	5	2	3	60	.....	.....	11	.....	.....
93	Virginia	1880	194	20	15	5	124	6	5	33	3	3
94		1890	231	23	12	11	167	7	2	26	4	2
95	Washington	1880	29	4	4	.....	23	.....	.....	2	.....	.....
96		1890	172	23	9	14	141	.....	.....	7	.....	1
97	West Virginia	1880	109	2	2	.....	96	2	1	6	1	1
98		1890	144	11	4	7	124	1	.....	6	.....	2
99	Wisconsin	1880	340	21	9	12	283	2	3	20	.....	11
100		1890	521	49	14	35	426	3	.....	26	3	14
101	Wyoming	1880	11	3	2	1	8	.....	.....	.....	.....	.....
102		1890	31	5	2	3	25	1	.....	.....	.....	.....

a See Dakota.

NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

CHARACTER OF PUBLICATION. Number devoted to—												
News, politics, and family reading.	Religion.	Agricultural, horticultural, dairy, and stock raising.	Commerce, finance, insurance, railroads, and trade.	General literature, including magazines.	Medicine and surgery.	Law.	Science and mechanics.	Freemasonry, Odd Fellowship, and temperance.	Education and history, including college and school publications.	Society, art, music, and fashion.	Miscellaneous.	
74	3	1	.....	5	.....	.....	.....	1	1	1	1	62
110	5	.....	1	6	.....	.....	.....	1	2	1	1	63
194	3	1	2	3	1	1	1	4	4	.....	1	64
260	13	1	3	5	.....	4	1	10	6	3	12	65
17	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66
38	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1	67
816	97	29	125	77	38	6	28	16	35	28	116	68
965	181	30	259	124	46	12	41	44	55	77	104	69
118	12	4	2	2	1	.....	.....	2	1	.....	.....	70
147	16	3	2	1	1	.....	.....	.....	4	.....	2	71
105	2	1	.....	.....	.....	.....	.....	1	2	.....	1	72
576	57	12	24	2	11	4	4	12	19	7	46	73
790	109	16	29	21	12	3	3	24	33	9	44	74
29	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75
60	5	1	2	2	1	.....	.....	.....	2	.....	1	76
116	6	2	3	.....	.....	.....	.....	1	4	.....	5	77
675	75	13	41	18	13	13	3	15	23	5	79	78
922	198	18	83	38	25	12	10	39	41	23	67	79
39	.....	.....	.....	.....	.....	.....	.....	3	2	.....	.....	80
46	4	.....	4	3	.....	.....	.....	6	5	.....	4	81
68	10	.....	.....	.....	.....	.....	.....	2	1	.....	.....	82
87	9	1	.....	1	.....	.....	.....	.....	1	.....	1	83
212	4	1	1	1	.....	.....	.....	.....	8	.....	.....	84
147	14	.....	4	5	3	.....	.....	4	9	.....	7	85
193	31	2	7	1	4	.....	1	2	9	1	3	86
254	14	2	2	2	.....	1	.....	2	1	1	1	87
447	12	9	8	4	4	.....	.....	4	5	2	17	88
15	4	1	.....	.....	.....	.....	.....	.....	.....	.....	2	89
22	3	4	3	3	.....	.....	.....	.....	1	.....	3	90
74	3	2	.....	1	.....	.....	.....	.....	2	.....	.....	91
63	3	.....	1	4	1	.....	.....	1	3	.....	.....	92
135	11	6	3	2	2	2	1	4	15	2	11	93
177	20	5	6	2	3	1	.....	2	10	3	2	94
28	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	95
155	2	3	6	.....	.....	.....	.....	.....	2	.....	4	96
100	3	.....	.....	1	.....	.....	.....	1	2	.....	2	97
127	4	1	3	1	.....	.....	.....	3	3	.....	2	98
301	7	4	5	2	.....	.....	1	7	8	1	4	99
444	13	17	5	9	.....	.....	2	8	7	2	14	100
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	101
30	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	102

b See Indian territory, including Oklahoma.

TABLE 4.—COMPARATIVE STATEMENT, NUMBER OF NEWSPAPERS AND PERIODICALS

	STATES AND TERRITORIES.	Year.	Total number of publications.	NUMBER OF PUBLICATIONS, CLASSIFIED ACCORDING TO LANGUAGE.											
				Armenian.	Bohemian.	Bohemian and English.	Catalan.	Chinese.	Dutch.	English.	Finnish.	French.	French and English.	Gaelic.	Gaelic and English.	German.
1	The United States	1880	11,314	.....	13	.....	1	2	9	10,515	.....	41	.....	.....	.....	641
2		1890	17,616	1	25	1	.....	3	18	16,457	4	43	6	1	3	790
3	Alabama	1880	125	.....	.....	.....	.....	.....	.....	125	.....	.....	.....	.....	.....	.....
4		1890	177	.....	.....	.....	.....	.....	.....	177	.....	.....	.....	.....	.....	.....
5	Arizona	1880	17	.....	.....	.....	.....	.....	.....	16	.....	.....	.....	.....	.....	.....
6		1890	35	.....	.....	.....	.....	.....	.....	34	.....	.....	.....	.....	.....	.....
7	Arkansas	1880	117	.....	.....	.....	.....	.....	.....	116	.....	.....	.....	.....	.....	1
8		1890	193	.....	.....	.....	.....	.....	.....	191	.....	.....	.....	.....	.....	2
9	California	1880	361	.....	.....	.....	.....	2	.....	328	.....	5	.....	.....	.....	15
10		1890	555	.....	.....	.....	.....	3	.....	515	.....	6	.....	.....	.....	17
11	Colorado	1880	87	.....	.....	.....	.....	.....	.....	84	.....	.....	.....	.....	.....	3
12		1890	257	.....	.....	.....	.....	.....	.....	251	.....	.....	.....	.....	.....	5
13	Connecticut	1880	139	.....	.....	.....	.....	.....	.....	134	.....	.....	.....	.....	.....	5
14		1890	180	.....	.....	.....	.....	.....	.....	171	.....	.....	.....	.....	.....	9
15	Dakota (c)	1880	67	.....	.....	.....	.....	.....	.....	65	.....	.....	.....	.....	.....	1
16		1890	339	.....	.....	1	.....	.....	1	325	.....	.....	1	.....	.....	4
17	Delaware	1880	26	.....	.....	.....	.....	.....	.....	25	.....	.....	.....	.....	.....	1
18		1890	41	.....	.....	.....	.....	.....	.....	39	.....	.....	.....	.....	.....	2
19	District of Columbia	1880	44	.....	.....	.....	.....	.....	.....	41	.....	.....	.....	.....	.....	3
20		1890	48	.....	.....	.....	.....	.....	.....	46	.....	.....	.....	.....	.....	2
21	Florida	1880	45	.....	.....	.....	.....	.....	.....	45	.....	.....	.....	.....	.....	.....
22		1890	122	.....	.....	.....	.....	.....	.....	121	.....	.....	.....	.....	.....	.....
23	Georgia	1880	200	.....	.....	.....	.....	.....	.....	199	.....	.....	.....	.....	.....	1
24		1890	279	.....	.....	.....	.....	.....	.....	278	.....	.....	.....	.....	.....	1
25	Idaho	1880	10	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	.....
26		1890	48	.....	.....	.....	.....	.....	.....	48	.....	.....	.....	.....	.....	.....
27	Illinois	1880	1,017	.....	4	.....	.....	.....	.....	920	.....	1	.....	.....	.....	70
28		1890	1,416	.....	7	.....	.....	.....	1	1,270	.....	2	.....	.....	1	81
29	Indiana	1880	467	.....	.....	.....	.....	.....	.....	435	.....	.....	.....	.....	.....	32
30		1890	680	.....	.....	.....	.....	.....	.....	646	.....	.....	.....	.....	.....	33
31	Indian territory (d)	1890	13	.....	.....	.....	.....	.....	.....	12	.....	.....	.....	.....	.....	.....
32	Indian territory, including	1880	3	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
33	Oklahoma. (e)	1890	43	.....	.....	.....	.....	.....	.....	42	.....	.....	.....	.....	.....	.....
34	Iowa	1880	569	.....	1	.....	.....	.....	2	523	.....	.....	.....	.....	.....	36
35		1890	804	.....	1	.....	.....	.....	3	750	.....	.....	.....	.....	.....	40
36	Kansas	1880	347	.....	.....	.....	.....	.....	.....	334	.....	.....	.....	.....	.....	11
37		1890	786	.....	.....	.....	.....	.....	.....	768	.....	.....	.....	.....	.....	14
38	Kentucky	1880	205	.....	.....	.....	.....	.....	.....	194	.....	.....	.....	.....	.....	11
39		1890	270	.....	.....	.....	.....	.....	.....	264	.....	.....	.....	.....	.....	6
40	Louisiana	1880	112	.....	.....	.....	.....	.....	.....	93	.....	15	.....	.....	.....	4
41		1890	173	.....	.....	.....	.....	.....	.....	154	.....	7	4	.....	.....	5
42	Maine	1880	123	.....	.....	.....	.....	.....	.....	123	.....	.....	.....	.....	.....	.....
43		1890	172	.....	.....	.....	.....	.....	.....	172	.....	.....	.....	.....	.....	.....
44	Maryland	1880	143	.....	.....	.....	.....	.....	.....	134	.....	.....	.....	.....	.....	9
45		1890	170	.....	.....	.....	.....	.....	.....	161	.....	.....	.....	.....	.....	9
46	Massachusetts	1880	427	.....	.....	.....	.....	.....	.....	422	.....	4	.....	.....	.....	1
47		1890	668	.....	.....	.....	.....	.....	.....	641	.....	13	1	.....	1	10
48	Michigan	1880	464	.....	.....	.....	.....	.....	6	439	.....	2	.....	.....	.....	15
49		1890	657	.....	.....	.....	.....	.....	9	606	2	3	.....	.....	.....	27
50	Minnesota	1880	223	.....	.....	.....	.....	.....	.....	202	.....	1	.....	.....	.....	13
51		1890	445	.....	.....	.....	.....	.....	.....	389	1	2	.....	.....	.....	18
52	Mississippi	1880	123	.....	.....	.....	.....	.....	.....	123	.....	.....	.....	.....	.....	.....
53		1890	161	.....	.....	.....	.....	.....	.....	161	.....	.....	.....	.....	.....	.....
54	Missouri	1880	530	.....	.....	.....	.....	.....	.....	494	.....	1	.....	.....	.....	34
55		1890	803	.....	1	.....	.....	.....	.....	754	.....	.....	.....	.....	.....	41
56	Montana	1880	18	.....	.....	.....	.....	.....	.....	18	.....	.....	.....	.....	.....	.....
57		1890	61	.....	.....	.....	.....	.....	.....	60	.....	.....	.....	.....	.....	1
58	Nebraska	1880	189	.....	1	.....	.....	.....	.....	175	.....	.....	.....	.....	.....	11
59		1890	550	.....	3	.....	.....	.....	.....	522	.....	.....	.....	.....	.....	16
60	Nevada	1880	37	.....	.....	.....	.....	.....	.....	37	.....	.....	.....	.....	.....	.....
61		1890	25	.....	.....	.....	.....	.....	.....	25	.....	.....	.....	.....	.....	.....
62	New Hampshire	1880	87	.....	.....	.....	.....	.....	.....	87	.....	.....	.....	.....	.....	.....
63		1890	127	.....	.....	.....	.....	.....	.....	123	.....	2	.....	.....	.....	2

a Choctaw.
b Embraces Norwegian, Swedish, and Danish publications.
c North and South Dakota combined for 1890 to compare with Dakota territory for 1880.

PRINTED IN DIFFERENT LANGUAGES, BY STATES AND TERRITORIES: 1880 AND 1890.

NUMBER OF PUBLICATIONS, CLASSIFIED ACCORDING TO LANGUAGE—continued.

German and English.	German and Hebrew.	Hebrew.	Hungarian.	Indian.	Indian (a) and English.	Irish.	Italian.	Italian and English.	Lithuanian.	Polish.	Portuguese.	Scandinavian. (b)	Slavonic, not specified.	Spanish.	Spanish and English.	Volapuk.	Volapuk and English.	Welsh.	Welsh and English.	
				3		1	4			2	2	49		26				5		1
30	4	6	2		1		14	2	1	22	2	130	2	33	7	2	1	4	1	2
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												9								59
																				60
																				61
																				62
																				63

d See Indian territory, including Oklahoma.
e Indian territory and Oklahoma combined for 1890 to compare with Indian territory for 1880.

TABLE 4.—COMPARATIVE STATEMENT, NUMBER OF NEWSPAPERS AND PERIODICALS PRINTED

	STATES AND TERRITORIES.	Year.	Total number of publications.	NUMBER OF PUBLICATIONS, CLASSIFIED ACCORDING TO LANGUAGE.											
				Armenian.	Bohemian.	Bohemian and English.	Catalan.	Chinese.	Dutch.	English.	Finnish.	French.	French and English.	Gaelic.	Gaelic and English.	German.
64	New Jersey	1880	215							196						19
65		1890	318						1	292		1				24
66	New Mexico	1880	18							14						
67		1890	41							33						
68	New York	1880	1,411		3		1			1,280		10				97
69		1890	1,938	1	4					1,772		5		1	1	111
70	North Carolina	1880	142							142						
71		1890	176							176						
72	North Dakota (a)	1890	112							105			1			1
73	Ohio	1880	774		1					683		1				89
74		1890	1,093		2					982	1					104
75	Oklahoma (b)	1890	30							30						
76	Oregon	1880	74							72						2
77		1890	137							132						3
78	Pennsylvania	1880	973							884						87
79		1890	1,476							1,372		1				87
80	Rhode Island	1880	44							42		1				1
81		1890	72							69		1				1
82	South Carolina	1880	81							80						1
83		1890	100							98						2
84	South Dakota (a)	1890	227			1			1	220						3
85	Tennessee	1880	193							192						1
86		1890	254							250						4
87	Texas	1880	280		1					261						13
88		1890	512		2					494						11
89	Utah	1880	22							22						
90		1890	39							36						1
91	Vermont	1880	82							82						
92		1890	76							76						
93	Virginia	1880	194							189						5
94		1890	231							227						4
95	Washington	1880	29							29						
96		1890	172							163						3
97	West Virginia	1880	109							107						2
98		1890	144							142						2
99	Wisconsin	1880	340		2				1	287						47
100		1890	521		5				3	409						87
101	Wyoming	1880	11							11						
102		1890	31							30						1

a See Dakota.

IN DIFFERENT LANGUAGES, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

NUMBER OF PUBLICATIONS, CLASSIFIED ACCORDING TO LANGUAGE—continued.

German and English.	German and Hebrew.	Hebrew.	Hungarian.	Indian.	Indian and English.	Irish.	Italian.	Italian and English.	Lithuanian.	Polish.	Portuguese.	Scandinavian.	Slavonic, not specified.	Spanish.	Spanish and English.	Volapuk.	Volapuk and English.	Welsh.	Welsh and English.	
																				64
																				65
														4						66
														5	3					67
						1	1				1	4		9				4		68
	4	3	1				5			4	1	7		14				4		69
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2										1							1			74
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5		2	1				2		1	1		2	2							79
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												6								96
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												3								99
5										2		10								100
																				101
																				102

b See Indian territory, including Oklahoma.

TABLE 4.—COMPARATIVE STATEMENT, NUMBER OF NEWSPAPERS AND PERIODICALS PRINTED

	STATES AND TERRITORIES.	Year.	Total number of publications.	NUMBER OF PUBLICATIONS, CLASSIFIED ACCORDING TO LANGUAGE.											
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64	New Jersey	1880	215							196						19
65		1890	318						1	292		1				24
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67		1890	41							33						
68	New York	1880	1,411		3		1			1,280		10				97
69		1890	1,938	1	4					1,772		5		1	1	111
70	North Carolina	1880	142							142						
71		1890	176							176						
72	North Dakota (a)	1890	112							105			1			1
73	Ohio	1880	774		1					683		1				89
74		1890	1,093		2					982	1					104
75	Oklahoma (b)	1890	30							30						
76	Oregon	1880	74							72						2
77		1890	137							132						3
78	Pennsylvania	1880	973							884						87
79		1890	1,476							1,372		1				87
80	Rhode Island	1880	44							42		1				1
81		1890	72							69		1				1
82	South Carolina	1880	81							80						1
83		1890	100							98						2
84	South Dakota (a)	1890	227			1			1	220						3
85	Tennessee	1880	193							192						1
86		1890	254							250						4
87	Texas	1880	280		1					261						13
88		1890	512		2					494						11
89	Utah	1880	22							22						
90		1890	39							36						1
91	Vermont	1880	82							82						
92		1890	76							76						
93	Virginia	1880	194							189						5
94		1890	231							227						4
95	Washington	1880	29							29						
96		1890	172							163						3
97	West Virginia	1880	109							107						2
98		1890	144							142						2
99	Wisconsin	1880	340		2				1	287						47
100		1890	521		5				3	409						57
101	Wyoming	1880	11							11						
102		1890	31							30						1

a See Dakota.

IN DIFFERENT LANGUAGES, BY STATES AND TERRITORIES: 1880 AND 1890—Continued.

NUMBER OF PUBLICATIONS, CLASSIFIED ACCORDING TO LANGUAGE—continued.

German and English.	German and Hebrew.	Hebrew.	Hungarian.	Indian.	Indian and English.	Irish.	Italian.	Italian and English.	Lithuanian.	Polish.	Portuguese.	Scandinavian.	Slavonic, not specified.	Spanish.	Spanish and English.	Volapuk.	Volapuk and English.	Welsh.	Welsh and English.	
																				64
																				65
														4						66
														5	3					67
						1	1				1	4		9				4		68
	4	3	1				5			4	1	7		14				4		69
																				70
																				71
1												4								72
																				73
2										1							1			74
																				75
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												1				1				77
											1							1		78
5		2	1				2		1	1		2	2							79
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5										2		10								100
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																				102

b See Indian territory, including Oklahoma.

TABLE 5.—DETAILED STATEMENT, NEWSPAPERS AND

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.						
			Aggregate.	Value of plant.				Live assets.	
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.
1	The United States	12,362	$126,269,885	$78,760,034	$10,409,896	$11,769,253	$56,580,885	$47,509,851	$5,997,471
2	Alabama	121	666,964	490,906	18,015	41,885	431,006	176,058	19,468
3	Arizona	21	100,598	70,050	1,000	9,850	59,200	30,548	6,162
4	Arkansas	144	500,349	323,240	18,445	24,335	280,460	177,109	36,975
5	California	376	4,345,600	3,193,578	612,282	736,602	1,844,494	1,152,022	145,779
6	Colorado	159	1,221,866	849,442	64,515	139,977	644,950	372,424	72,740
7	Connecticut	123	1,284,375	810,261	56,300	65,900	688,061	474,114	67,601
8	Delaware	26	241,164	169,700	25,700	27,300	116,700	71,404	5,760
9	District of Columbia	13	537,502	372,158	32,000	52,000	288,158	165,344	20,707
10	Florida	83	405,055	324,391	6,415	12,225	305,751	80,664	20,021
11	Georgia	204	1,286,729	1,003,100	144,670	170,025	688,405	283,629	72,335
12	Idaho	29	144,990	85,010	7,510	15,950	61,550	59,980	10,950
13	Illinois	996	9,714,024	5,338,353	173,057	564,567	4,600,729	4,375,671	457,368
14	Indiana	505	2,506,675	1,751,633	123,510	158,650	1,469,473	755,042	126,406
15	Indian territory	8	23,790	15,825			15,825	7,965	1,525
16	Iowa	643	3,501,710	2,337,298	212,305	361,810	1,823,183	1,164,412	187,771
17	Kansas	627	2,313,876	1,622,840	147,900	188,061	1,286,879	691,036	107,311
18	Kentucky	184	2,397,213	1,593,127	189,825	360,595	1,042,707	804,086	130,272
19	Louisiana	116	815,083	475,211	37,475	55,425	382,311	339,872	44,603
20	Maine	105	1,140,152	661,027	17,725	59,650	583,652	479,125	61,621
21	Maryland	113	1,385,133	953,525	188,525	183,500	581,500	431,608	40,225
22	Massachusetts	409	7,531,827	3,562,036	128,200	216,050	3,217,786	3,969,791	218,674
23	Michigan	506	3,436,287	2,232,274	194,175	249,650	1,788,449	1,204,013	167,562
24	Minnesota	341	3,693,259	1,789,318	93,725	286,775	1,406,818	1,903,941	139,406
25	Mississippi	114	297,757	198,495	10,105	19,705	168,685	99,262	10,675
26	Missouri	596	4,578,490	2,771,474	277,490	425,544	2,068,440	1,807,016	227,450
27	Montana	41	509,267	367,758	24,100	47,660	295,998	141,509	28,980
28	Nebraska	412	2,143,488	1,299,101	93,932	155,480	1,049,689	844,387	113,407
29	Nevada	11	73,290	57,200	4,600	10,500	42,100	16,090	2,490
30	New Hampshire	83	754,183	512,460	28,100	76,350	408,010	241,723	31,831
31	New Jersey	224	2,373,213	1,825,350	171,900	231,825	1,421,625	547,863	98,211
32	New Mexico	31	120,068	76,950	5,800	8,450	62,700	43,118	7,325
33	New York	1,263	29,716,028	18,123,764	4,061,676	3,335,248	10,726,840	11,592,264	1,633,750
34	North Carolina	120	449,877	303,532	30,300	48,975	224,257	146,345	20,074
35	North Dakota	78	491,274	351,880	22,825	72,675	256,380	139,394	22,044
36	Ohio	724	7,738,089	4,870,207	430,436	666,225	3,773,546	2,867,882	396,449
37	Oklahoma	15	46,145	39,700	2,750	1,800	35,150	6,445	1,525
38	Oregon	111	653,419	396,535	19,500	32,435	344,600	256,884	40,905
39	Pennsylvania	992	16,070,348	10,315,243	1,906,575	1,592,184	6,816,484	5,755,105	663,773
40	Rhode Island	40	661,944	485,267	81,820	109,200	294,247	176,677	23,672
41	South Carolina	76	438,704	289,025	22,400	47,550	219,075	149,679	12,269
42	South Dakota	149	579,169	410,562	25,735	57,625	327,202	168,607	28,331
43	Tennessee	178	1,798,359	1,170,294	205,788	259,825	704,681	538,065	54,389
44	Texas	391	1,670,937	1,114,316	63,945	156,993	893,378	556,621	72,609
45	Utah	21	537,098	223,568	54,200	24,600	144,768	313,530	105,237
46	Vermont	55	455,393	283,678	21,535	47,900	214,243	171,715	33,491
47	Virginia	157	756,320	442,334	45,795	66,675	329,864	313,986	22,329
48	Washington	125	1,035,182	780,109	94,150	113,057	572,902	255,073	38,702
49	West Virginia	103	438,110	307,900	20,950	36,100	250,850	130,210	15,761
50	Wisconsin	379	2,645,930	1,632,099	183,550	192,725	1,255,824	1,013,831	123,975
51	Wyoming	21	133,642	86,930	6,665	10,965	69,300	46,712	6,575

PERIODICALS, BY STATES AND TERRITORIES: 1890.

CAPITAL—continued.								
Live assets—Continued.		Miscellaneous expenses.						
Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.	Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	
$5,866,454	$35,645,926	$35,727,039	$3,884,824	$605,687	$638,257	$996,355	$680,127	$28,921,789	1
3,594	152,996	135,654	18,417	3,789	3,807	2,986	4,607	102,048	2
1,840	22,546	19,100	5,640	1,242	706	620	996	9,896	3
13,802	126,332	122,419	23,619	3,579	3,328	4,542	4,932	82,419	4
43,302	962,941	1,118,276	154,557	19,465	20,114	15,934	21,402	886,804	5
22,105	277,579	257,337	38,673	9,648	7,181	8,715	13,220	179,891	6
19,940	386,573	271,730	42,855	7,212	9,487	8,335	7,465	196,376	7
655	64,989	22,776	4,962	653	606	537	780	15,238	8
3,227	141,410	123,440	15,190	2,613	2,326	2,316	100	100,895	9
8,666	51,977	73,332	14,806	2,392	3,102	1,956	1,996	49,080	10
27,931	183,363	300,163	29,660	12,570	7,798	8,296	4,648	237,191	11
3,348	45,682	21,011	3,719	1,407	1,217	1,255	2,133	11,280	12
609,233	3,309,070	3,282,077	421,053	43,509	60,465	72,617	42,105	2,642,328	13
63,437	565,199	540,595	88,456	16,543	13,666	17,415	13,712	390,803	14
605	5,835	3,245	1,450	139	231	115	.....	1,310	15
81,652	894,989	547,460	99,988	20,603	21,269	21,828	24,985	358,787	16
37,726	545,999	348,083	83,349	15,841	12,286	12,006	21,295	203,306	17
154,879	518,935	395,065	41,596	8,548	12,805	12,734	10,462	308,920	18
10,385	284,884	325,820	26,753	6,378	5,753	6,306	2,963	277,667	19
26,515	390,989	244,936	28,787	6,116	7,567	8,669	5,225	188,572	20
63,588	827,795	307,413	48,942	7,159	5,194	17,876	4,886	223,356	21
741,779	3,009,338	3,070,184	293,189	46,697	38,980	38,646	89,330	2,563,342	22
140,533	895,918	701,001	87,428	17,253	20,592	17,460	24,251	534,017	23
552,166	1,212,369	891,956	111,149	12,873	13,843	11,496	35,537	707,058	24
3,187	85,400	45,505	10,540	1,523	2,156	1,997	1,953	27,336	25
125,286	1,454,280	1,043,820	154,766	27,369	26,568	36,904	20,940	777,273	26
6,828	105,701	69,045	15,632	2,972	3,511	4,488	7,813	34,629	27
92,943	638,037	432,539	81,996	10,157	10,962	15,416	20,228	293,780	28
1,200	12,400	14,322	1,744	965	586	960	188	9,680	29
17,196	192,696	114,013	19,361	2,628	3,633	7,515	2,258	78,618	30
55,896	393,756	477,214	72,503	12,148	10,995	11,425	10,713	359,430	31
4,120	31,673	33,405	6,003	1,006	723	1,024	675	23,974	32
1,046,860	8,911,654	11,281,003	968,928	107,373	109,335	393,556	64,176	9,637,635	33
6,466	119,805	89,455	13,779	3,066	2,286	3,056	3,047	64,221	34
12,771	104,579	59,106	11,227	3,225	4,107	3,940	6,093	30,514	35
476,961	1,994,452	1,681,680	191,164	47,696	44,241	49,141	39,242	1,310,196	36
420	4,500	17,736	2,726	20	271	610	260	13,849	37
14,210	201,769	172,662	25,717	3,725	4,871	3,025	7,402	127,922	38
1,109,467	3,981,865	4,753,106	320,819	51,914	69,752	92,332	91,575	4,126,714	39
9,625	143,380	192,815	13,775	3,525	3,829	7,430	8,537	155,719	40
3,258	134,152	83,419	10,004	3,616	2,679	1,103	5,304	60,713	41
12,360	127,916	88,758	21,527	4,686	4,306	4,116	5,164	48,959	42
20,720	462,956	291,540	32,302	9,260	12,464	6,670	8,235	222,409	43
21,906	462,106	444,470	72,663	10,674	11,280	23,647	9,238	316,968	44
54,145	154,148	110,133	18,663	3,149	1,915	3,257	5,648	77,501	45
11,060	127,164	55,691	8,443	1,781	2,688	2,111	3,520	37,148	46
28,437	263,220	173,345	25,344	4,541	4,231	6,291	1,772	131,166	47
12,381	203,990	205,376	25,520	4,502	8,728	6,364	5,400	154,867	48
4,827	109,622	74,383	9,837	2,322	2,315	2,525	1,438	55,946	49
81,184	808,672	574,866	60,389	14,294	16,484	13,987	11,739	457,973	50
1,812	38,325	24,258	4,714	1,321	1,022	805	530	15,866	51

TABLE 5.—DETAILED STATEMENT, NEWSPAPERS AND

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.									
		Aggregates.		Officers or firm members actively engaged in the business or in supervision.				Editors, subeditors, and reporters.			
				Males above 16 years.		Females above 15 years.		Males above 16 years.		Females above 15 years.	
		Average number.	Total wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States	106,095	$68,601,532	10,972	$11,326,208	228	$149,669	10,050	$10,443,351	488	$306 071
2	Alabama	647	371,767	86	77,271	1	600	51	41,970	1	416
3	Arizona	124	83,091	22	20,340			7	6,000		
4	Arkansas	624	322,742	93	72,764	4	1,966	30	23,037	2	300
5	California	3,405	2,800,203	329	401,656	7	6,312	410	447,039	13	5,688
6	Colorado	1,221	1,064,301	142	147,890	5	2,662	135	149,170	5	2,720
7	Connecticut	1,286	868,171	136	162,606			182	119,578	3	2,016
8	Delaware	215	108,150	23	23,550			23	14,710		
9	District of Columbia	497	389,731	15	39,525			60	67,022	2	2,289
10	Florida	515	260,113	62	51,016	5	4,300	31	26,900	6	2,516
11	Georgia	1,415	769,724	165	136,447	1	2,000	126	96,761	7	4,026
12	Idaho	117	80,027	29	22,264	1	416	7	8,020		
13	Illinois	9,502	6,431,079	1,005	1,148,900	32	26,056	922	964,914	35	19,731
14	Indiana	3,251	1,631,819	468	396,720	14	7,093	241	180,119	17	8,260
15	Indian territory	23	9,828	1	300			3	1,800		
16	Iowa	3,576	1,744,480	571	451,866	3	1,920	149	97,440	10	3,990
17	Kansas	2,588	1,132,043	513	332,905	11	3,896	117	74,500	10	3,384
18	Kentucky	1,800	1,106,423	146	185,367	3	1,180	170	141,824	10	4,734
19	Louisiana	937	687,378	90	107,195	2	3,416	120	117,432	14	10,128
20	Maine	1,343	632,159	102	93,336	4	2,795	85	73,339	11	7,154
21	Maryland	1,251	846,819	100	109,044	5	2,924	179	231,701	7	3,432
22	Massachusetts	5,996	4,144,307	388	464,337	11	6,430	603	579,781	57	35,392
23	Michigan	3,668	1,824,744	399	315,438	10	4,200	282	254,304	10	3,776
24	Minnesota	2,630	1,707,637	297	324,689	3	1,380	182	165,669	42	19,602
25	Mississippi	384	158,038	81	51,895	2	650	25	13,364		
26	Missouri	5,291	3,407,446	573	614,131	13	7,174	489	463,401	18	10,809
27	Montana	307	330,862	38	47,690			26	34,381		
28	Nebraska	1,918	1,125,363	337	269,612	4	1,367	120	119,554	4	1,664
29	Nevada	63	58,725	5	5,804			5	4,820		
30	New Hampshire	651	317,764	60	43,426	1	364	44	27,658	2	924
31	New Jersey	2,199	1,365,376	190	235,164	1	780	189	158,178	8	3,650
32	New Mexico	140	88,833	24	17,400	1	416	10	9,700		
33	New York	18,086	14,933,132	1,295	2,013,851	23	18,118	2,340	3,315,476	100	92,767
34	North Carolina	567	236,590	71	49,054			26	20,946	1	300
35	North Dakota	337	203,352	53	44,024	1	500	13	11,464		
36	Ohio	7,292	4,063,564	722	657,550	16	7,480	564	472,148	20	10,006
37	Oklahoma	83	32,131	9	4,340			5	2,608		
38	Oregon	700	556,889	83	89,209	6	5,529	58	69,036	6	3,856
39	Pennsylvania	10,658	6,567,603	828	928,568	9	13,359	1,181	1,086,976	44	28,317
40	Rhode Island	579	374,894	47	52,548			68	61,243	1	624
41	South Carolina	449	237,385	56	41,049			43	35,741		
42	South Dakota	578	301,545	115	76,328	2	936	24	16,170	1	400
43	Tennessee	1,357	827,531	142	132,724	3	1,960	128	122,066	8	5,336
44	Texas	1,995	1,193,550	300	240,067	5	2,820	139	124,381	6	3,864
45	Utah	378	279,277	26	37,296			28	33,520	1	500
46	Vermont	403	208,694	44	39,140	1	300	29	21,670	2	1,050
47	Virginia	899	442,131	133	93,661	1	520	71	54,048		
48	Washington	797	683,827	92	100,201			93	110,657		
49	West Virginia	532	222,052	82	56,114	1	520	29	19,596		
50	Wisconsin	2,728	1,285,724	368	279,156	14	5,590	174	144,559	4	2,480
51	Wyoming	93	82,518	16	18,780	2	1,740	5	6,960		

PERIODICALS, BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.																
Clerks.				Operatives, skilled and unskilled.						Pieceworkers.						
Males above 16 years.		Females above 15 years.		Males above 16 years.		Females above 15 years.		Children.		Males above 16 years.		Females above 15 years.		Children.		
Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	
6,694	$5,371,597	2,316	$929,699	47,442	$26,482,191	7,200	$2,138,021	5,940	$638,913	12,932	$10,034,505	1,899	$778,100	24	$3,207	1
30	26,492	.....	.....	334	184,367	16	4,550	69	7,049	58	28,272	1	780	.....	.....	2
11	5,672	.....	.....	65	43,342	9	4,435	7	582	3	2,720	.....	.....	.....	.....	3
12	9,492	3	1,100	359	185,349	25	6,871	65	8,100	25	12,763	6	1,000	.....	.....	4
254	251,497	16	6,771	1,397	1,061,479	229	86,492	215	23,063	474	469,904	61	40,302	.....	.....	5
62	61,034	4	1,316	651	589,627	53	27,072	89	16,099	71	64,613	4	2,098	.....	.....	6
55	48,086	12	5,128	507	321,460	112	41,808	37	4,955	203	148,286	39	14,248	.....	.....	7
14	5,684	2	572	90	38,692	14	3,003	12	1,722	36	19,817	1	400	.....	.....	8
42	33,024	22	11,181	128	73,223	9	2,376	5	330	190	156,081	15	4,680	.....	.....	9
14	11,430	5	2,700	250	121,152	23	6,192	71	6,967	48	26,940	.....	.....	.....	.....	10
63	41,852	22	10,202	754	395,136	65	16,875	81	7,399	118	56,486	13	2,540	.....	.....	11
1	860	.....	.....	61	44,137	6	1,830	10	1,300	2	1,200	.....	.....	.....	.....	12
538	446,457	252	112,405	4,049	2,361,216	751	259,499	572	60,157	1,253	993,523	84	37,519	9	702	13
110	72,529	31	10,094	1,506	667,613	283	71,658	261	28,992	284	175,291	36	11,450	.....	.....	14
.....	.....	.....	.....	13	6,570	3	784	3	374	.....	.....	.....	.....	.....	.....	15
115	76,685	33	10,824	1,739	811,394	347	83,028	335	30,938	234	161,362	39	14,963	1	100	16
49	28,061	23	7,893	1,229	493,848	233	56,346	223	24,599	150	99,917	28	6,594	2	100	17
87	63,906	34	16,453	882	453,371	86	21,251	102	11,127	275	205,080	5	2,130	.....	.....	18
58	61,120	13	4,658	333	178,535	37	10,620	39	6,347	224	187,567	1	360	.....	.....	19
64	40,504	224	61,624	455	208,261	201	61,432	16	1,767	101	54,326	80	27,621	.....	.....	20
98	73,062	5	1,970	536	194,177	18	4,062	29	4,051	272	221,336	2	1,040	.....	.....	21
463	448,150	260	136,686	2,262	1,338,051	623	246,959	60	8,616	741	632,462	528	247,443	.....	.....	22
157	112,570	38	12,090	1,536	703,771	356	87,644	461	40,191	370	274,253	49	16,507	.....	.....	23
140	129,558	47	21,726	1,275	681,358	162	58,151	131	16,461	320	273,622	31	15,421	.....	.....	24
4	1,970	.....	.....	184	71,282	28	7,263	46	4,065	18	7,041	1	508	.....	.....	25
297	253,775	70	30,095	2,358	1,207,006	347	92,936	233	24,848	827	683,977	66	19,294	.....	.....	26
12	16,551	2	1,350	160	152,713	10	6,444	7	2,096	49	67,096	3	2,541	.....	.....	27
98	65,911	24	11,254	933	541,355	132	41,160	144	17,464	104	49,516	18	6,506	.....	.....	28
2	1,980	.....	.....	26	20,638	2	600	1	120	22	24,763	.....	.....	.....	.....	29
9	7,520	8	3,600	306	152,696	82	25,257	20	2,064	51	27,411	68	26,844	.....	.....	30
70	65,438	147	44,416	1,120	587,299	61	14,478	71	9,051	286	229,072	56	17,850	.....	.....	31
6	5,810	2	460	68	40,716	4	1,820	8	1,208	11	7,999	6	3,304	.....	.....	32
1,999	1,619,956	491	218,100	7,741	5,442,472	907	259,027	640	66,564	2,243	1,765,463	304	120,898	3	440	33
9	4,674	.....	.....	337	131,320	13	2,697	88	14,095	22	13,504	.....	.....	.....	.....	34
7	5,465	3	1,336	177	99,024	31	10,614	13	2,221	39	28,704	.....	.....	.....	.....	35
416	311,920	147	50,024	3,347	1,649,949	617	152,111	307	30,816	1,038	687,104	98	34,456	.....	.....	36
.....	.....	.....	.....	55	23,517	3	620	11	1,046	.....	.....	.....	.....	.....	.....	37
35	41,542	3	1,400	296	217,134	73	27,692	45	5,336	83	86,207	12	9,948	.....	.....	38
729	573,794	280	94,920	4,922	2,486,256	566	146,112	576	58,534	1,419	1,119,259	95	29,643	9	1,865	39
24	19,354	7	2,514	231	150,436	23	8,652	84	10,672	77	63,770	17	5,081	.....	.....	40
20	14,308	.....	.....	244	96,958	5	1,004	22	2,700	58	45,505	1	120	.....	.....	41
17	14,612	3	524	276	148,633	59	15,462	33	3,479	43	23,073	5	1,928	.....	.....	42
89	65,657	22	9,850	624	276,098	79	24,336	54	6,072	190	173,556	18	9,876	.....	.....	43
76	54,052	14	6,542	1,024	545,619	68	21,187	126	15,423	224	175,550	13	4,045	.....	.....	44
28	23,810	1	500	151	109,308	43	13,179	41	6,792	54	52,411	5	1,961	.....	.....	45
12	8,548	8	3,600	169	83,319	53	17,331	20	2,247	30	18,306	35	13,183	.....	.....	46
40	20,754	2	514	483	200,053	12	1,846	85	7,341	71	54,244	1	150	.....	.....	47
42	37,739	1	520	335	252,694	43	17,591	34	4,156	152	157,388	5	2,881	.....	.....	48
17	9,990	2	520	233	95,605	39	7,381	78	6,084	49	25,992	2	250	.....	.....	49
109	78,722	19	6,171	1,183	495,898	234	57,095	259	22,983	318	174,373	46	18,697	.....	.....	50
.....	.....	8	6,096	48	39,064	5	1,188	1	250	7	7,400	1	1,040	.....	.....	51

TABLE 5.—DETAILED STATEMENT, NEWSPAPERS AND

	STATES AND TERRITORIES.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, CLERKS, EDITORS, SUBEDITORS, AND REPORTERS, BUT NOT THOSE EMPLOYED ON PIECEWORK.											
		Males above 16 years.											
		Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.
1	The United States	75,068	7,914	3,663	3,394	3,394	3,718	5,229	9,138	11,043	13,657	6,396	7,522
2	Alabama	501	57	20	30	23	28	81	38	61	78	60	16
3	Arizona	105	2	1	3	10	6	8	9	13	38	14	2
4	Arkansas	494	53	27	33	32	37	62	69	42	102	19	18
5	California	2,390	128	72	53	68	52	75	205	272	613	356	496
6	Colorado	990	27	11	21	12	8	24	59	103	183	224	318
7	Connecticut	880	65	35	57	22	24	35	76	175	238	79	74
8	Delaware	150	25	11	6	14	9	12	27	19	12	9	6
9	District of Columbia	254	14	21	10	18	14	12	20	10	68	15	50
10	Florida	357	44	23	16	7	22	30	63	68	43	24	17
11	Georgia	1,108	138	65	47	56	63	55	144	258	185	53	44
12	Idaho	98	2	4	3	4	6	4	4	14	29	22	6
13	Illinois	6,514	546	211	261	267	340	372	711	1,141	1,228	771	666
14	Indiana	2,325	320	147	164	154	167	216	335	307	338	97	81
15	Indian territory	17		2			1	3	6	5			
16	Iowa	2,574	389	182	133	147	162	178	345	455	432	83	68
17	Kansas	1,908	226	162	132	187	187	156	325	232	210	62	29
18	Kentucky	1,285	144	76	95	67	70	90	169	178	243	101	72
19	Louisiana	601	62	26	15	11	23	37	96	76	113	53	89
20	Maine	706	98	46	32	24	62	60	109	111	102	40	27
21	Maryland	913	126	52	34	25	45	45	117	189	141	79	60
22	Massachusetts	3,716	278	165	153	99	160	189	449	604	808	315	496
23	Michigan	2,374	293	107	146	126	159	204	445	334	346	113	111
24	Minnesota	1,894	188	85	73	73	92	106	254	396	332	142	152
25	Mississippi	294	51	38	13	15	21	26	54	34	18	10	4
26	Missouri	3,717	329	177	171	151	214	595	386	537	575	286	316
27	Montana	226	4	2	2	6	1	7	16	12	41	55	90
28	Nebraska	1,488	93	77	86	57	116	101	254	173	261	173	97
29	Nevada	38	2	1	2	2	1			7	13	3	7
30	New Hampshire	419	44	18	29	22	15	29	87	98	53	19	10
31	New Jersey	1,569	200	62	73	58	80	122	180	312	292	101	89
32	New Mexico	108	4	3	3		4	5	22	18	28	15	6
33	New York	13,375	1,060	473	397	501	413	654	1,226	1,775	2,953	1,461	2,462
34	North Carolina	443	94	53	27	33	24	32	65	58	34	15	8
35	North Dakota	250	21	14	11	9	9	23	39	52	51	19	11
36	Ohio	5,049	665	312	272	312	256	409	679	712	860	315	257
37	Oklahoma	69	1	7	8		7	12	21	5	3	5	
38	Oregon	472	16	15	9	9	8	11	38	78	114	60	114
39	Pennsylvania	7,660	1,117	384	384	396	382	626	1,005	1,051	1,176	504	635
40	Rhode Island	370	17	8	8	8	6	27	35	67	118	31	45
41	South Carolina	363	73	30	19	18	13	32	56	40	62	10	10
42	South Dakota	432	29	22	20	25	37	56	70	69	56	32	16
43	Tennessee	983	150	62	52	59	67	41	133	155	114	55	95
44	Texas	1,589	152	83	65	63	67	85	269	255	310	117	73
45	Utah	238	22	7	5	4	7	4	21	93	54	42	44
46	Vermont	254	17	18	13	21	6	33	41	56	31	10	8
47	Virginia	727	117	73	48	55	51	61	89	70	98	30	35
48	Washington	562	21	17	15	7	14	19	34	64	138	141	92
49	West Virginia	381	72	26	32	29	20	29	38	34	50	19	12
50	Wisconsin	1,834	322	127	110	97	141	138	214	228	260	121	76
51	Wyoming	69	1	1	3	1		9		2	12	28	12

PERIODICALS, BY STATES AND TERRITORIES: 1890—Continued.

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, CLERKS, EDITORS, SUBEDITORS, AND REPORTERS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.

Females above 15 years.											Children.					
Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over.	
10,232	3,137	1,692	1,560	914	688	595	762	457	288	88	51	5,940	5,731	144	34	31	1
18	6	3	4	1	1		2	1				69	48	21			2
9	2				4		2			1		7	7				3
34	12	6	4	4	3		3		2			65	63	2			4
265	52	38	40	26	19	23	24	23	8	11	1	215	202	9	3	1	5
67	3	4	4	9	10	4	10	11	11	1		89	72	7	9	1	6
127	20	24	17	17	7	14	18	7	2	1		37	36			1	7
16	10		4	1	1							12	12				8
33	4	6	2	3		1	10	4	2		1	5	5				9
39	12	8	1	2	2	3	4	3		4		71	70	1			10
95	23	34	14		5	2	12	1	2		2	81	79	2			11
7	2	1	1		1	2						10	9	1			12
1,070	207	152	146	116	85	94	157	65	28	12	8	572	570	2			13
345	174	58	28	25	18	12	19	4	7			261	255	3	3		14
3	2			1								3	3				15
393	206	73	47	19	20	13	9	2	4			335	329	3	1	2	16
277	127	54	32	19	16	10	13	3	3			223	216	7			17
133	45	37	13	8	3	4	9	7	3	4		102	96	4	2		18
72	10	7	26	6		4	6	3	8	1	1	39	37	1	1		19
440	137	129	90	40	16	3	14	2	9			16	16				20
35	13	5	1	7		1	2	5		1		29	28	1			21
951	110	73	137	130	142	83	117	100	46	9	4	60	58	1	1		22
414	160	121	62	25	26	4	7	8	1			461	458	3			23
254	50	30	23	47	14	47	19	16	4	2	2	131	125	4		2	24
30	15	3	5	2	3	1		1				46	46				25
448	179	88	28	36	24	26	30	17	15	2	3	233	224	8	1		26
12					1		5	3	3			7	2	1	1	3	27
164	52	21	19	17	18	7	13	9	7	1		144	142	2			28
2		2										1	1				29
93	24	14	16	12	5	13	7	2				20	20				30
217	102	46	48	8	2	2	5	1	3			71	70		1		31
7	1	1		2	1	1	1					8	8				32
1,521	407	200	242	139	98	110	119	98	66	20	22	640	620	18	2		33
14	10	2	1								1	88	72	1		15	34
35	8	2	11	2	4	3	4	1				13	13				35
800	322	184	146	51	28	25	16	15	11	1	1	307	304	2		1	36
3	1	2										11	10			1	37
88	17	8	6	17	8	6	10	6	7		3	45	43	1		1	38
899	316	130	224	60	55	37	37	16	12	11	1	576	542	30	4		39
31	8	2	3	11	7	1	2	1	1			84	84				40
5	4	1										22	21	1			41
65	24	16	9	7	3	3	1	2				33	31	2			42
112	11	30	33	2	6	2	19	4	5			54	53		1		43
88	28	9	11	4	6	11	9	7	5	2	1	126	124	1	1		44
45	21	10	4	2	2	2	4					41	36	3	2		45
64	11	10	12	8	8	11	4					20	20				46
15	11	1		1			2					85	85				47
44	7	2	7	6	2	3	7	6	4	2		34	31	1		2	48
42	31	6	1	3			1					78	78				49
271	141	39	35	18	14	5	9	3	3	1		259	257		1	1	50
15	4					2		2	6	1		1		1			51

TABLE 5.—DETAILED STATEMENT, NEWSPAPERS AND

	STATES AND TERRITORIES.	MATERIALS USED.								
		Aggregate cost.	Paper used on newspapers and periodicals.							
			Totals.		Daily.		Weekly, semiweekly, and triweekly.		Monthly, quarterly, and all other.	
			Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.	Pounds.	Cost.
1	The United States	$38,955,322	552,876,161	$23,905,384	326,620,576	$11,930,793	170,260,470	$8,765,517	55,995,115	$3,209,074
2	Alabama	159,555	2,007,288	95,792	1,151,611	47,751	835,521	46,554	20,156	1,487
3	Arizona	26,557	189,620	10,677	119,710	5,841	69,910	4,836	.....	.....
4	Arkansas	181,126	1,063,505	62,380	367,336	16,242	701,419	44,257	14,750	1,881
5	California	1,426,629	20,229,809	994,062	15,729,848	699,031	4,072,126	261,302	427,835	33,749
6	Colorado	439,558	4,984,842	268,517	4,279,167	213,295	644,595	51,413	61,080	3,809
7	Connecticut	339,698	4,676,762	194,580	3,379,714	131,667	986,740	46,176	310,308	16,737
8	Delaware	37,503	580,218	22,259	433,600	14,930	139,308	6,835	7,310	494
9	District of Columbia	300,794	5,357,486	248,043	2,613,567	95,970	2,568,854	141,695	175,065	10,378
10	Florida	110,292	1,036,382	48,903	581,325	24,101	451,889	24,534	3,168	268
11	Georgia	537,271	7,028,445	318,915	3,550,135	144,149	2,666,542	123,033	811,768	51,733
12	Idaho	28,237	141,176	9,592	48,800	2,765	92,376	6,827	.....	.....
13	Illinois	4,000,623	60,907,589	2,627,842	37,739,620	1,358,813	17,988,060	940,585	5,179,909	328,144
14	Indiana	774,429	8,619,064	405,424	4,224,821	169,097	3,584,895	186,003	809,348	50,324
15	Indian territory	6,811	43,786	3,166	2,730	136	41,036	3,030	.....	.....
16	Iowa	863,764	7,809,310	385,858	3,242,350	135,133	4,387,406	238,642	179,554	12,083
17	Kansas	556,941	5,276,496	270,700	2,532,989	109,096	2,674,719	157,133	68,788	4,471
18	Kentucky	481,713	5,780,580	222,801	3,188,353	104,973	2,516,379	112,883	75,848	4,945
19	Louisiana	288,846	3,906,224	166,307	2,920,032	115,021	923,902	47,062	62,290	4,224
20	Maine	367,256	5,779,649	221,571	1,165,574	49,567	1,162,775	60,683	3,451,300	111,321
21	Maryland	431,560	6,477,706	292,411	4,998,834	213,706	1,367,612	71,684	111,260	7,021
22	Massachusetts	2,902,340	34,734,860	1,654,770	19,294,602	686,604	11,330,855	734,650	4,109,403	233,516
23	Michigan	915,521	11,680,577	481,459	6,299,294	218,634	4,812,430	230,176	568,853	32,649
24	Minnesota	771,151	10,193,158	444,973	6,205,498	230,796	3,960,510	159,954	927,150	54,233
25	Mississippi	71,759	493,593	29,236	124,286	5,075	356,852	23,147	12,455	1,014
26	Missouri	1,708,128	27,462,453	1,137,348	18,654,621	678,017	7,705,705	390,823	1,102,127	68,508
27	Montana	101,519	783,627	43,860	547,623	28,344	232,804	15,218	3,200	298
28	Nebraska	569,920	5,583,456	263,412	3,193,843	125,828	2,262,277	129,230	127,336	8,354
29	Nevada	15,227	158,962	7,982	139,579	6,668	19,383	1,314	.....	.....
30	New Hampshire	190,829	1,911,461	81,469	916,101	34,269	972,472	45,240	22,888	1,960
31	New Jersey	566,188	6,447,571	276,661	3,709,505	148,314	1,707,501	86,088	1,030,565	42,259
32	New Mexico	34,577	160,834	11,086	96,730	6,238	63,804	4,813	300	35
33	New York	9,650,150	165,413,361	6,841,425	94,075,399	3,176,472	47,485,425	2,263,822	23,852,537	1,401,131
34	North Carolina	116,750	1,111,101	53,174	475,460	19,877	622,408	32,261	13,233	1,036
35	North Dakota	112,769	510,604	28,649	187,100	8,837	313,564	19,103	9,940	709
36	Ohio	2,404,807	29,823,811	1,281,068	15,776,259	563,123	10,715,912	517,014	3,331,640	180,931
37	Oklahoma	14,398	98,445	5,532	66,317	3,035	31,768	2,449	360	48
38	Oregon	209,813	2,150,770	121,573	1,250,824	62,453	836,720	55,655	63,226	3,465
39	Pennsylvania	4,448,814	71,130,406	2,827,670	46,727,701	1,593,436	16,726,551	778,157	7,676,154	456,077
40	Rhode Island	187,758	3,135,927	116,855	2,578,150	91,331	542,167	24,570	15,610	954
41	South Carolina	74,755	1,007,108	47,309	557,730	20,775	445,778	26,306	3,600	228
42	South Dakota	124,528	813,714	49,162	290,832	15,153	473,662	30,925	49,220	3,084
43	Tennessee	368,500	5,185,720	222,283	2,772,684	95,783	2,028,696	103,089	384,340	23,411
44	Texas	514,635	5,345,193	261,291	2,709,270	112,269	2,502,033	139,650	132,990	9,372
45	Utah	113,953	1,206,050	67,687	785,530	41,689	338,400	19,687	82,120	6,311
46	Vermont	120,838	996,377	50,817	247,000	9,460	527,262	29,304	222,115	12,053
47	Virginia	173,334	1,977,387	92,898	1,115,320	44,549	778,027	43,343	84,040	5,006
48	Washington	234,127	2,615,931	125,756	1,877,740	82,422	695,471	39,913	42,720	3,421
49	West Virginia	114,765	1,080,543	51,088	614,775	24,314	460,904	26,360	4,864	414
50	Wisconsin	734,777	7,574,249	348,906	2,962,567	120,560	4,259,290	212,818	352,392	15,528
51	Wyoming	29,529	172,995	10,165	98,120	5,194	74,875	4,971	.....	.....

PERIODICALS, BY STATES AND TERRITORIES: 1890—Continued.

MATERIALS USED—continued.								VALUE OF PRODUCTS.					
Paper used in book and job printing.		Ink.		Rent of power and heat.	Fuel.	Office supplies.	All other materials.	Total.	Advertising.	Subscriptions and sales.	Book and job printing.	All other products.	
Pounds.	Cost.	Pounds.	Cost.	Cost.	Cost.	Cost.	Cost.						
118,053,331	$9,984,352	8,496,697	$1,428,921	$200,677	$984,426	$1,033,855	$1,417,707	$179,859,750	$71,243,361	$72,343,087	$32,812,113	$3,461,189	1
475,303	38,995	40,362	6,757	1,970	3,366	10,647	2,028	809,577	365,654	332,460	110,573	890	2
125,950	12,595	7,200	1,549	160	531	695	350	154,590	59,680	54,950	39,310	650	3
969,400	97,150	28,263	6,053	600	4,789	7,654	2,500	737,588	232,376	228,885	217,652	58,675	4
2,848,750	258,216	504,650	49,150	8,622	43,887	35,452	37,220	6,500,445	3,099,453	2,496,152	809,772	95,068	5
1,105,028	120,337	51,841	11,540	547	16,233	17,594	4,790	2,211,057	1,125,534	678,746	382,065	24,712	6
909,661	90,562	79,844	15,757	3,915	11,877	10,163	12,844	1,775,664	766,517	723,590	275,289	10,268	7
95,180	9,718	10,755	1,529	268	863	1,741	1,125	202,496	105,316	64,330	29,175	3,675	8
121,846	11,973	72,891	8,983	2,140	3,706	13,676	12,273	1,173,567	582,918	553,865	35,184	1,600	9
472,745	46,718	17,163	4,771	681	3,244	5,395	580	524,108	188,589	185,299	145,795	4,425	10
1,513,272	143,764	145,142	26,993	5,356	16,931	18,521	6,791	2,078,024	838,034	795,252	420,373	24,365	11
132,570	13,047	5,294	1,419	125	1,078	2,490	486	160,783	67,060	49,980	40,589	3,154	12
11,996,547	925,994	521,760	114,698	17,000	76,924	114,692	123,473	17,348,845	7,072,055	6,453,618	3,328,026	495,146	13
3,430,722	279,870	128,515	31,616	5,197	22,710	17,765	11,847	3,589,513	1,413,047	1,371,040	760,457	44,969	14
28,500	2,750	935	245	.....	335	150	165	26,912	9,360	8,930	8,322	300	15
3,590,096	358,239	223,491	32,911	6,836	37,144	29,083	13,693	3,818,623	1,371,817	1,298,876	1,039,211	108,719	16
2,177,170	202,762	99,317	22,399	6,931	22,466	19,410	12,273	2,514,749	1,007,019	874,229	591,430	42,071	17
1,937,693	174,490	131,790	26,178	3,144	19,031	8,494	27,575	2,552,701	953,254	878,231	570,234	150,982	18
933,785	90,607	112,361	9,550	3,214	5,913	7,807	5,448	1,547,951	717,586	563,419	258,976	7,970	19
996,620	92,352	78,666	16,567	4,730	11,773	10,849	9,414	1,719,477	575,122	830,028	295,844	18,483	20
877,210	85,834	62,636	15,123	1,781	16,224	11,123	9,064	2,004,724	1,039,291	700,414	262,341	2,678	21
10,253,090	878,783	344,386	70,701	18,435	51,712	49,191	178,748	12,019,706	3,970,820	4,579,100	3,081,329	388,457	22
3,428,963	316,240	138,965	31,654	6,092	37,948	20,421	21,707	4,350,948	1,711,309	1,562,780	942,902	133,957	23
2,256,790	209,426	122,343	24,043	10,255	20,376	31,066	31,012	4,157,026	1,639,136	1,514,469	767,513	235,908	24
324,665	33,612	14,868	3,263	817	1,477	2,475	879	384,797	139,576	139,449	102,322	3,450	25
5,282,681	357,858	260,834	53,828	5,135	44,139	47,188	62,632	7,920,887	3,465,701	3,360,419	985,182	109,585	26
406,260	41,376	24,851	5,453	1,210	3,010	4,430	2,180	569,226	227,865	199,879	137,702	3,780	27
2,118,905	197,829	99,852	19,353	3,334	24,990	28,122	32,880	2,676,183	1,091,110	916,880	587,114	81,079	28
43,750	4,425	2,466	850	.....	1,085	475	410	106,497	51,835	41,374	13,288	.....	29
1,036,527	87,443	27,839	6,489	2,005	6,817	3,549	3,057	805,751	263,253	281,533	254,160	6,805	30
2,278,456	220,407	95,066	20,154	3,554	18,920	10,780	15,712	2,965,362	1,201,280	1,033,011	695,463	35,608	31
154,742	15,550	5,817	2,261	.....	738	1,672	3,270	206,681	78,230	74,250	30,812	23,389	32
22,268,042	1,647,025	2,866,334	399,738	33,926	175,048	206,830	346,158	44,393,071	17,861,315	19,981,507	6,156,922	393,327	33
577,130	46,951	23,945	4,631	194	4,363	4,466	2,971	595,635	211,733	228,977	146,952	7,973	34
650,550	65,274	21,213	3,526	150	7,258	4,447	3,465	503,782	179,216	128,176	191,424	4,966	35
9,230,149	813,539	544,802	99,583	12,886	66,999	57,515	73,217	10,928,510	3,850,306	4,509,809	2,345,064	223,311	36
72,500	6,949	2,805	590	.....	741	466	120	72,905	26,300	19,195	27,410	.....	37
644,945	56,229	51,262	15,571	985	7,455	5,859	2,141	1,130,762	544,328	407,499	174,698	4,237	38
12,712,938	1,008,545	941,791	156,040	14,960	91,885	113,628	236,086	20,536,538	7,345,234	9,035,348	3,728,535	427,421	39
486,460	45,132	40,744	7,379	627	7,758	6,986	3,021	900,283	443,901	283,139	171,223	2,020	40
158,805	16,720	18,409	2,985	.....	3,207	2,687	1,847	518,927	212,081	233,580	54,082	19,184	41
561,622	56,234	19,173	5,076	50	6,965	4,805	2,236	627,828	249,433	200,982	165,541	11,872	42
1,047,195	98,685	87,610	14,996	995	10,447	15,906	5,788	1,832,228	737,741	742,026	295,708	56,753	43
1,811,615	181,333	141,210	22,630	2,030	17,109	20,469	9,773	2,757,522	1,263,338	949,652	533,221	11,311	44
316,250	33,825	18,634	3,449	1,170	3,382	2,380	2,060	591,805	271,770	211,785	94,300	13,950	45
422,568	44,035	18,995	4,100	1,015	5,125	4,043	11,703	461,796	141,027	181,133	135,891	3,745	46
559,040	57,326	37,913	6,138	1,715	5,824	4,237	5,196	1,008,150	424,255	393,818	186,047	4,030	47
696,270	79,046	44,801	8,038	1,280	9,186	6,433	4,388	1,400,064	759,784	389,501	235,816	14,963	48
477,575	48,408	18,334	4,095	1,110	3,029	4,990	2,045	537,362	188,351	200,906	138,355	9,750	49
2,894,450	246,264	131,909	26,631	3,186	26,882	24,665	58,243	3,256,897	1,015,423	1,339,402	773,114	128,958	50
140,350	13,910	6,650	1,888	344	1,526	873	823	191,227	88,028	61,214	39,385	2,600	51

TABLE 6.—PERIODS OF ISSUE AND CHARACTER OF PUBLICATION,

	STATES AND TERRITORIES.	NUMBER OF PUBLICATIONS IN EXISTENCE DURING THE CENSUS YEAR.										
		Periods of issue.										
		Total.	Daily.				Weekly.	Semi-weekly.	Tri-weekly.	Monthly.	Quarterly.	All other.
			Total.	Morning.	Evening.	6 days per week.	7 days per week.					
1	The United States	17,616	1,731	599	1,132	1,465	266	12,721	214	40	2,247	271	392
2	Alabama	177	16	9	7	12	4	143	1		11	2	4
3	Arizona	35	9	6	3	7	2	26					
4	Arkansas	193	14	4	10	13	1	168	2		8		1
5	California	555	96	45	51	85	11	380	12	2	54	1	10
6	Colorado	257	28	11	17	22	6	207	3	1	17		1
7	Connecticut	180	35	12	23	33	2	111	2	1	25	1	5
8	Delaware	41	5	2	3	4	1	31			5		
9	District of Columbia	48	4	2	2	2	2	29			11	2	2
10	Florida	122	14	6	8	10	4	101		2	3		2
11	Georgia	279	24	16	8	16	8	210	1		39	1	4
12	Idaho	48	3	2	1	3		43	2				
13	Illinois	1,416	125	44	81	102	23	968	21	2	225	33	42
14	Indiana	680	97	18	79	83	14	489	3		74	6	11
15	Indian territory	13	1	1		1		12					
16	Iowa	804	49	18	31	41	8	675	15	2	52	4	7
17	Kansas	786	45	12	33	45		701	3		29	1	7
18	Kentucky	270	27	12	15	19	8	208	8	1	19		7
19	Louisiana	173	14	8	6	8	6	140	1		13	1	4
20	Maine	172	17	6	11	17		101	2		44	3	5
21	Maryland	170	13	9	4	9	4	128			18	5	6
22	Massachusetts	668	60	12	48	52	8	373	7		168	37	23
23	Michigan	657	53	12	41	43	10	522	5	2	60	1	14
24	Minnesota	445	30	11	19	23	7	355	1		49	2	8
25	Mississippi	161	7	3	4	5	2	139		3	9		3
26	Missouri	803	83	28	55	67	16	585	7	2	88	13	25
27	Montana	61	10	4	6	8	2	42	2	1	4		2
28	Nebraska	550	37	9	28	30	7	486	2		17		8
29	Nevada	25	10	3	7	10		15					
30	New Hampshire	127	20	4	16	18	2	90	4		12		1
31	New Jersey	318	48	16	32	47	1	231	1	2	27	4	5
32	New Mexico	41	4	1	3	3	1	36					1
33	New York	1,938	168	66	102	133	35	1,075	34	4	517	66	74
34	North Carolina	176	21	9	12	21		135	3		9	3	5
35	North Dakota	112	7	3	4	6	1	98	2		5		
36	Ohio	1,093	125	28	97	109	16	738	19	7	151	25	28
37	Oklahoma	30	7	3	4	7		22			1		
38	Oregon	137	16	7	9	15	1	109	1		10		1
39	Pennsylvania	1,476	164	52	112	146	18	901	14	3	305	43	46
40	Rhode Island	72	10	3	7	7	3	42	2	1	15	1	1
41	South Carolina	100	6	4	2	2	4	85	2	1	3	2	1
42	South Dakota	227	21	8	13	20	1	189	3		13		1
43	Tennessee	254	19	8	11	12	7	196	2		27	6	4
44	Texas	512	44	15	29	39	5	433	6	1	26	1	1
45	Utah	39	9	4	5	8	1	10	9		8		3
46	Vermont	76	5	2	3	4	1	60			11		
47	Virginia	231	23	12	11	20	3	167	7	2	26	4	2
48	Washington	172	22	8	14	18	5	141			7		1
49	West Virginia	144	11	4	7	10	1	124	1		6		2
50	Wisconsin	531	49	14	35	45	4	426	3		28	3	14
51	Wyoming	31	5	2	3	5		25	1				

NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES: 1890.

NUMBER OF PUBLICATIONS IN EXISTENCE DURING THE CENSUS YEAR—continued.

Character of publication.

News, politics, and family reading.	Religion.	Agricultural, horticultural, dairy, and stock raising.	Commerce, finance, insurance, and railroads.	Trade.	General literature, including magazines.	Sunday newspapers.	Medicine and surgery.	Law.	Science and mechanics.	Freemasonry, Odd Fellowship, and temperance.	Education and history.	Society, art, music, and fashion.	College and school periodicals.	Miscellaneous.	
13,147	1,182	312	287	491	387	173	187	51	123	277	166	198	230	405	1
149	14	4	.....	1	1	2	1	.....	2	1	1	.....	1	.....	2
31	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3
176	8	1	.....	.....	.....	.....	1	.....	1	3	.....	.....	2	1	4
428	20	14	13	22	10	3	5	1	3	9	3	3	2	19	5
218	6	3	5	5	3	1	2	.....	3	4	1	2	.....	4	6
133	11	5	1	3	8	4	1	.....	3	1	2	1	6	1	7
31	2	1	.....	.....	.....	2	.....	.....	.....	.....	.....	1	2	2	8
20	1	1	3	1	.....	5	.....	3	4	3	1	1	.....	5	9
105	4	4	1	3	.....	.....	.....	.....	.....	1	2	1	.....	1	10
222	14	5	2	3	3	2	6	.....	2	1	5	3	6	5	11
47	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12
950	114	31	31	80	35	9	19	5	20	23	9	20	10	60	13
553	32	22	5	13	1	10	7	.....	2	9	3	2	11	10	14
11	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	15
707	31	7	6	2	3	1	2	.....	.....	15	7	4	10	9	16
724	11	9	3	2	1	.....	1	.....	.....	7	4	4	10	10	17
218	20	4	3	6	1	4	3	1	.....	1	2	.....	5	2	18
127	11	6	6	2	.....	1	2	.....	1	2	.....	.....	3	12	19
112	8	7	1	1	24	2	.....	.....	.....	4	4	3	4	2	20
129	11	4	3	3	2	1	3	.....	2	1	2	1	1	7	21
353	86	15	15	23	42	8	7	2	14	19	15	15	18	36	22
542	39	10	3	6	7	7	7	1	1	11	5	3	9	6	23
355	22	7	6	8	10	4	2	2	3	6	3	4	5	8	24
143	8	4	.....	.....	1	.....	.....	.....	.....	1	2	.....	2	.....	25
593	63	16	22	31	9	3	19	4	4	6	7	7	6	13	26
50	3	5	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	27
510	5	8	2	6	2	1	3	.....	.....	3	1	2	3	4	28
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29
110	5	.....	.....	1	6	.....	.....	.....	.....	1	1	1	1	1	30
260	13	1	1	2	5	8	.....	4	1	10	2	3	4	4	31
38	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	32
965	181	30	94	165	124	27	46	12	41	44	32	77	23	77	33
147	16	3	1	1	1	.....	1	.....	.....	.....	1	.....	3	2	34
105	2	1	.....	.....	.....	.....	.....	.....	.....	1	1	.....	1	1	35
790	109	16	12	17	21	19	12	3	3	24	13	9	20	25	36
29	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37
116	6	2	2	1	.....	2	.....	.....	.....	1	3	.....	1	3	38
922	198	18	28	55	38	23	25	12	10	39	15	23	26	44	39
46	4	.....	2	2	3	4	.....	.....	.....	6	2	.....	3	.....	40
87	9	1	.....	.....	1	1	.....	.....	.....	.....	.....	.....	1	.....	41
212	4	1	.....	1	1	.....	.....	.....	.....	.....	4	.....	4	.....	42
193	31	2	3	4	1	1	4	.....	1	2	2	1	7	2	43
447	12	9	1	7	4	5	4	.....	.....	4	1	2	4	12	44
22	3	4	1	2	3	.....	.....	.....	.....	.....	1	.....	.....	3	45
63	3	.....	.....	1	4	.....	1	.....	.....	1	1	.....	2	.....	46
177	20	5	5	1	2	.....	3	1	.....	2	2	3	8	2	47
155	2	3	4	2	.....	1	.....	.....	.....	.....	1	.....	1	3	48
127	4	1	.....	3	1	2	.....	.....	.....	3	2	.....	1	.....	49
444	13	17	2	3	9	9	.....	.....	2	8	3	2	4	5	50
30	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51

TABLE 6.—PERIODS OF ISSUE AND CHARACTER OF PUBLICATION,

	STATES AND TERRITORIES.	NUMBER OF PUBLICATIONS REPORTING.											
		Total.	Periods of issue.										
			Daily.					Weekly.	Semi-weekly.	Tri-weekly.	Monthly.	Quarterly.	All other.
			Total.	Morning.	Evening.	6 days per week.	7 days per week.						
1	The United States	14,901	1,610	559	1,051	1,353	257	10,814	194	34	1,734	225	290
2	Alabama	136	14	8	6	10	4	108	1		9	2	2
3	Arizona	29	8	6	2	6	2	21					
4	Arkansas	164	14	4	10	13	1	142			7		1
5	California	455	87	42	45	76	11	311	11	2	37	1	6
6	Colorado	186	23	11	12	17	6	153	3	1	6		
7	Connecticut	156	34	12	22	32	2	95	2		20	1	4
8	Delaware	32	5	2	3	4	1	23			4		
9	District of Columbia	17	4	2	2	2	2	11			2		
10	Florida	97	12	4	8	9	3	80		2	1		2
11	Georgia	230	19	11	8	11	8	177	1		29	1	3
12	Idaho	33	3	2	1	3		28	2				
13	Illinois	1,241	121	44	77	98	23	858	20	2	182	29	29
14	Indiana	620	92	17	75	78	14	448	2		61	6	11
15	Indian territory	9	1	1		1		8					
16	Iowa	703	46	18	28	38	8	593	14	2	39	4	5
17	Kansas	693	43	12	31	43		621	3		22	1	3
18	Kentucky	218	25	12	13	17	8	165	7	1	13		7
19	Louisiana	129	12	6	6	6	6	99	1		13	1	3
20	Maine	146	15	5	10	15		88	1		36	2	4
21	Maryland	124	11	9	2	7	4	102			6	2	3
22	Massachusetts	568	56	12	44	48	8	336	7		123	31	15
23	Michigan	589	52	12	40	42	10	472	5	1	49	1	9
24	Minnesota	392	30	11	19	23	7	311	1		42	2	6
25	Mississippi	119	6	2	4	4	2	102		1	7		3
26	Missouri	707	81	27	54	65	16	516	7	2	73	9	19
27	Montana	52	9	3	6	7	2	37	1	1	3		1
28	Nebraska	446	31	6	25	25	6	395	2		11		7
29	Nevada	15	6	3	3	6		9					
30	New Hampshire	111	16	3	13	14	2	83	2		10		
31	New Jersey	263	47	15	32	46	1	186	1	2	21	3	3
32	New Mexico	34	4	1	3	3	1	29					1
33	New York	1,627	162	64	98	129	33	927	31	4	395	49	59
34	North Carolina	135	20	9	11	20		102	3		5	3	2
35	North Dakota	87	7	3	4	6	1	74	2		4		
36	Ohio	932	121	27	94	106	15	635	19	7	106	25	19
37	Oklahoma	21	6	3	3	6		14			1		
38	Oregon	126	16	7	9	15	1	100	1		8		1
39	Pennsylvania	1,271	143	45	98	127	16	771	13	3	266	37	38
40	Rhode Island	54	9	3	6	7	2	30	1		13	1	
41	South Carolina	84	6	4	2	2	4	73	2	1		1	1
42	South Dakota	174	19	7	12	18	1	141	3		10		1
43	Tennessee	219	18	8	10	11	7	169	2		20	6	4
44	Texas	437	42	13	29	37	5	367	6	1	19	1	1
45	Utah	28	9	4	5	8	1	6	7		4		2
46	Vermont	70	5	2	3	4	1	58			7		
47	Virginia	185	21	11	10	18	3	134	6	1	18	3	2
48	Washington	144	18	6	12	14	4	118			7		1
49	West Virginia	112	9	4	5	8	1	95	1		5		2
50	Wisconsin	456	47	14	33	43	4	373	3		20	3	10
51	Wyoming	25	5	2	3	5		20					

NEWSPAPERS AND PERIODICALS, BY STATES AND TERRITORIES: 1890—Continued.

NUMBER OF PUBLICATIONS REPORTING—continued.															
Character of publication.															
News, politics, and family reading.	Religion.	Agricultural, horticultural, dairy, and stock raising.	Commerce, finance, insurance, and railroads.	Trade.	General literature, including magazines.	Sunday newspapers.	Medicine and surgery.	Law.	Science and mechanics.	Freemasonry, Odd Fellowship, and temperance.	Education and history.	Society, art, music, and fashion.	College and school periodicals.	Miscellaneous.	
11,326	1,025	263	239	432	291	143	123	47	83	216	119	152	137	305	1
110	14	4		1	1	2	1		2	1					2
26		3													3
150	6	1					1		1	3			2		4
356	15	11	10	22	7	3	3	1	2	6	3	2		14	5
174	3	2	1	1		1			1	1		1		1	6
119	11	5	1	3	5	3	1		1	1	2		3	1	7
24	2	1				1						1	1	2	8
10	1					1		3						2	9
83	4	4	1	3								1		1	10
185	13	2	2	3	2	1	5		2	1	5	2	5	2	11
32				1											12
862	102	30	27	72	18	5	12	5	17	18	7	19	3	44	13
508	27	20	5	13	1	10	6		1	9	2	2	7	9	14
7	1													1	15
630	26	7	5	1	3					9	4	2	8	8	16
647	9	8	1	1			1			5	4	4	6	7	17
177	15	4	2	6	1	4	1	1		1	1		3	2	18
86	10	5	6	2		1	2			2			3	12	19
97	6	5			21	2				4	4	3	3	1	20
106	5	2	1	2	1	1	2			1		1	1	1	21
326	77	14	12	18	27	5	2	1	11	15	13	12	8	27	22
495	36	8	2	3	6	7	4		1	9	4	2	6	6	23
316	19	5	5	6	8	4	1	2	3	5	3	3	5	7	24
105	7	3			1					1	2				25
526	58	15	20	30	5	2	11	4	4	5	6	7	3	11	26
45	2	3		1										1	27
414	3	8	2	5	2	1	1			2	1	2	3	2	28
15															29
97	5			1	5					1		1		1	30
218	10	1		1	5	5		2	1	9	2	3	3	3	31
32	1					1									32
862	155	23	81	147	98	24	27	12	24	34	26	52	11	51	33
114	12	3	1				1						2	2	34
81	1	1								1	1		1	1	35
694	101	8	8	14	15	18	9	3	2	16	6	6	11	21	36
20	1														37
108	6	2	2	1		1				1	1		1	3	38
784	175	15	28	50	35	20	23	12	8	35	13	19	15	39	39
33	4		2	2	3	3				3	1		3		40
75	7	1				1									41
162	4	1		1	1						2		3		42
169	26	2	3	3	1	1	3		1	1	1	1	5	2	43
382	8	9	1	6	3	5	3			3	1	2	3	11	44
17	3	2		2	3									1	45
61	3			1	3		1				1				46
144	17	4	4	1	1		2	1		2	1	2	4	2	47
127	2	3	4	2		1					1		1	3	48
99	2	1		3	1	2				3			1		49
392	10	16	2	3	8	7			1	8	1	2	3	3	50
24		1													51

TABLE 7.—CIRCULATION AND CONSUMPTION OF PAPER, NEWSPAPERS

	STATES AND TERRITORIES.	Number of publications reporting.	AGGREGATE CIRCULATION PER ISSUE.							AGGREGATE NUMBER OF COPIES PRINTED DURING THE CENSUS YEAR.	
			Total (all classes).	Dailies.	Weeklies.	Semi-weeklies.	Tri-weeklies.	Monthlies.	Quarterlies.	All other.	Total (all classes).	Dailies.
1	The United States..	14,901	69,138,934	8,387,188	28,954,515	561,743	50,067	19,624,038	8,124,500	3,436,883	4,681,113,530	2,782,282,406
2	Alabama	136	246,847	32,154	173,477	1,660	.....	8,766	29,600	1,950	19,277,464	9,800,020
3	Arizona	29	22,309	5,210	17,099	.....	.....	.....	.....	.....	2,551,928	1,663,980
4	Arkansas	164	192,749	15,917	166,482	.....	.....	9,750	.....	600	13,768,353	5,039,160
5	California	455	1,151,389	399,454	604,050	6,810	750	123,425	7,000	9,900	163,716,618	129,641,287
6	Colorado	186	229,669	68,150	128,809	2,160	1,300	29,250	.....	.....	30,022,108	22,710,240
7	Connecticut	156	496,084	117,246	182,472	1,490	.....	185,276	4,500	5,100	48,253,243	36,312,898
8	Delaware	32	55,582	20,450	30,132	.....	.....	5,000	.....	.....	8,033,402	6,308,000
9	District of Columbia	17	321,151	62,651	243,500	.....	.....	15,000	.....	.....	31,715,418	18,645,418
10	Florida	97	107,257	16,605	87,052	.....	1,000	2,000	.....	600	10,113,301	5,393,025
11	Georgia	230	733,223	70,546	442,250	2,000	.....	178,827	3,000	36,600	48,512,208	23,070,652
12	Idaho	33	21,270	1,700	18,690	880	.....	.....	.....	.....	1,593,500	532,200
13	Illinois	1,241	7,891,219	774,486	3,437,663	30,820	900	1,627,250	1,867,800	152,300	465,924,592	254,386,744
14	Indiana	620	1,299,418	166,051	673,798	2,840	.....	371,909	29,200	55,620	94,466,572	53,221,555
15	Indian territory	9	8,995	500	8,495	.....	.....	.....	.....	.....	480,740	39,000
16	Iowa	703	1,068,019	110,563	795,077	14,397	4,800	133,032	12,750	17,400	80,780,202	35,257,579
17	Kansas	693	756,746	82,266	596,089	2,450	.....	72,983	700	2,228	57,469,332	25,739,453
18	Kentucky	218	727,781	135,150	445,485	20,200	3,300	29,451	.....	94,195	71,542,310	44,325,835
19	Louisiana	129	358,183	78,600	225,883	5,200	.....	40,600	1,700	6,200	40,145,248	27,477,600
20	Maine	146	2,442,046	41,545	230,642	1,350	.....	1,964,659	2,000	201,850	53,206,443	12,981,070
21	Maryland	124	392,068	137,085	210,310	.....	.....	22,075	13,850	8,748	56,855,415	46,192,315
22	Massachusetts	568	4,662,159	445,781	1,802,125	25,440	.....	1,327,740	781,910	279,163	261,440,450	141,242,704
23	Michigan	589	1,511,915	212,975	869,764	6,690	1,700	377,734	10,552	32,500	122,904,401	71,451,380
24	Minnesota	392	1,023,005	180,433	518,563	15,000	.....	148,933	2,000	158,076	95,551,359	61,452,210
25	Mississippi	119	108,061	7,350	91,206	.....	500	5,950	.....	3,055	7,266,800	2,300,550
26	Missouri	707	2,615,135	428,094	1,346,714	28,700	2,610	624,767	135,500	48,750	225,731,297	146,506,687
27	Montana	52	68,980	19,170	44,750	1,250	960	1,850	.....	1,000	9,106,770	6,455,500
28	Nebraska	446	635,505	84,698	447,757	900	.....	83,850	.....	18,300	52,037,259	27,577,635
29	Nevada	15	14,530	8,700	5,830	.....	.....	.....	.....	.....	3,010,210	2,708,050
30	New Hampshire	111	261,040	37,900	201,752	1,450	.....	19,938	.....	.....	21,314,338	11,782,500
31	New Jersey	263	1,496,777	160,746	278,791	2,200	1,300	1,036,315	3,125	4,300	75,855,311	48,930,363
32	New Mexico	34	23,157	5,134	17,523	.....	.....	.....	.....	500	2,524,262	1,603,880
33	New York	1,627	18,031,391	2,119,101	6,347,827	100,998	14,550	6,990,400	1,712,200	746,315	1,177,147,744	735,139,251
34	North Carolina	135	176,077	23,110	139,867	2,000	.....	9,050	1,500	2,550	14,821,936	7,234,350
35	North Dakota	87	86,425	9,220	66,405	2,000	.....	8,800	.....	.....	6,357,508	2,600,581
36	Ohio	932	5,639,781	499,712	1,996,400	44,230	9,825	956,522	1,342,997	790,095	306,568,217	161,161,014
37	Oklahoma	21	14,654	3,450	10,104	.....	.....	1,100	.....	.....	1,462,332	1,017,290
38	Oregon	126	208,855	32,712	154,243	1,400	.....	20,000	.....	500	19,159,764	10,764,684
39	Pennsylvania	1,271	9,472,083	1,241,514	3,135,664	65,078	5,700	2,763,798	1,624,741	635,588	633,014,569	407,817,246
40	Rhode Island	54	148,868	67,959	59,668	425	.....	20,468	350	.....	26,228,741	22,842,567
41	South Carolina	84	121,672	17,125	97,922	925	200	.....	3,500	2,000	11,248,784	5,963,600
42	South Dakota	174	142,362	13,812	105,000	2,400	.....	17,150	.....	4,000	10,336,238	4,328,960
43	Tennessee	219	1,450,118	82,941	756,105	4,140	.....	98,582	495,500	12,850	72,094,743	28,894,503
44	Texas	437	658,183	87,123	498,557	7,240	480	53,783	1,000	10,000	55,640,136	28,057,494
45	Utah	28	68,000	20,525	8,200	20,075	.....	12,000	.....	7,200	9,626,740	6,796,300
46	Vermont	70	207,565	10,700	100,265	.....	.....	96,600	.....	.....	9,189,590	2,828,950
47	Virginia	185	346,056	47,106	218,748	3,720	192	56,290	17,500	2,500	28,172,077	15,579,569
48	Washington	144	204,488	48,954	139,134	.....	.....	15,950	.....	450	23,547,244	16,204,412
49	West Virginia	112	130,328	22,600	101,128	250	.....	5,500	.....	850	12,428,686	7,059,500
50	Wisconsin	456	1,053,389	107,594	657,300	133,105	.....	51,715	20,625	83,050	86,422,737	35,705,695
51	Wyoming	25	24,370	4,620	19,750	.....	.....	.....	.....	.....	2,473,860	1,446,860

AND PERIODICALS, BY STATES AND TERRITORIES: 1890.

AGGREGATE NUMBER OF COPIES PRINTED DURING THE CENSUS YEAR—continued.						AGGREGATE NUMBER OF POUNDS OF PAPER CONSUMED FOR EACH EDITION.							
Weeklies.	Semi-weeklies.	Tri-weeklies.	Monthlies.	Quarterlies.	All other.	Total (all classes).	Dailies.	Weeklies.	Semi-weeklies.	Tri-weeklies.	Monthlies.	Quarterlies.	All other.	
1,492,466,587	57,637,353	7,634,350	232,617,133	32,479,100	76,002,601	9,350,920	963,189	3,143,275	64,389	8,399	3,646,220	836,068	688,780	1
8,963,444	156,000	.....	105,200	116,000	46,800	21,088	3,274	15,811	200	.....	1,343	350	110	2
887,948	.....	.....	.....	.....	.....	1,725	370	1,355	.....	.....	.....	.....	.....	3
8,597,793	.....	.....	117,000	.....	14,400	15,671	1,164	13,518	.....	.....	960	.....	29	4
31,596,351	655,080	114,000	1,464,200	28,000	217,700	158,069	45,726	77,132	482	25	32,872	345	1,487	5
6,547,628	224,640	195,000	344,600	.....	.....	30,816	12,889	12,347	140	300	5,140	.....	.....	6
9,426,633	151,300	.....	2,219,212	18,000	125,200	55,230	10,501	18,702	114	.....	25,315	108	490	7
1,667,402	.....	.....	58,000	.....	.....	4,702	1,392	2,681	.....	.....	629	.....	.....	8
12,890,000	.....	.....	180,000	.....	.....	71,611	7,593	49,518	.....	.....	14,500	.....	.....	9
4,525,876	.....	156,000	24,000	.....	14,400	10,576	1,784	8,485	.....	75	200	.....	32	10
22,774,628	208,000	.....	2,144,528	12,000	302,400	132,282	10,468	51,097	75	.....	66,832	600	3,210	11
971,780	89,520	.....	.....	.....	.....	1,875	156	1,642	77	.....	.....	.....	.....	12
177,501,368	3,137,080	140,400	19,630,700	7,451,200	3,677,100	912,856	110,784	342,400	7,861	57	330,070	84,357	37,327	13
35,032,428	295,161	.....	4,464,748	117,800	1,334,880	141,507	13,121	68,581	197	.....	51,179	1,760	6,669	14
441,740	.....	.....	.....	.....	.....	823	35	788	.....	.....	.....	.....	.....	15
41,292,939	1,375,316	717,800	1,601,468	51,000	484,100	107,177	9,820	81,079	1,241	420	11,567	1,470	1,580	16
30,565,741	258,920	.....	876,450	2,800	25,968	65,561	8,145	51,565	127	.....	5,484	.....	240	17
22,124,200	1,983,200	504,800	328,200	.....	2,277,075	61,648	9,206	45,399	1,290	127	3,783	.....	1,843	18
11,511,348	540,800	.....	480,300	6,800	128,400	31,222	8,149	17,683	115	.....	4,660	300	315	19
11,660,925	140,400	.....	23,572,848	8,000	4,843,200	285,808	3,727	24,079	70	.....	227,509	270	30,153	20
10,114,000	.....	.....	283,700	55,400	210,000	51,577	15,004	26,193	.....	.....	6,970	2,690	720	21
92,222,798	2,597,280	.....	15,315,728	3,134,240	6,927,700	715,751	56,026	211,928	2,029	.....	227,206	191,442	27,120	22
45,157,637	694,960	265,200	4,529,316	42,208	763,700	155,822	18,409	91,017	494	150	37,362	1,500	6,890	23
26,942,986	1,560,000	.....	1,790,546	8,000	3,797,617	132,695	18,678	55,622	1,650	.....	35,911	965	19,869	24
4,742,900	.....	78,000	71,950	.....	73,400	8,093	402	6,903	.....	25	488	.....	275	25
67,465,050	2,932,800	407,160	6,783,800	542,000	1,093,800	307,684	52,192	142,149	2,891	352	79,371	21,908	8,821	26
2,326,220	130,000	148,760	22,200	.....	24,000	6,072	1,031	4,045	125	60	156	.....	55	27
22,978,624	69,600	.....	1,004,600	.....	406,800	64,587	9,941	43,907	60	.....	9,039	.....	1,640	28
302,160	.....	.....	.....	.....	.....	816	444	372	.....	.....	.....	.....	.....	29
9,139,782	150,800	.....	241,256	.....	.....	24,097	2,860	19,238	90	.....	1,909	.....	.....	30
13,963,968	228,800	163,200	12,434,780	12,500	101,700	130,970	12,219	32,529	170	70	85,585	210	181	31
910,382	.....	.....	.....	.....	10,000	1,537	305	1,217	.....	.....	.....	.....	15	32
328,502,023	10,329,144	2,192,150	82,421,516	6,842,200	11,721,460	3,460,699	276,771	869,128	16,423	5,328	1,639,092	210,976	442,981	33
7,206,686	206,000	.....	107,700	6,000	61,200	14,539	1,539	11,729	137	.....	975	112	47	34
3,439,327	208,000	.....	109,600	.....	.....	7,299	580	5,679	200	.....	840	.....	.....	35
103,697,551	4,598,720	1,526,800	11,427,864	5,372,388	18,783,880	553,090	47,813	197,619	2,906	1,033	137,759	114,886	51,074	36
431,842	.....	.....	13,200	.....	.....	1,042	220	792	.....	.....	30	.....	.....	37
7,998,480	145,600	.....	239,000	.....	12,000	24,759	3,541	16,064	70	.....	4,884	.....	200	38
162,756,769	6,679,292	889,060	33,067,167	6,498,664	15,286,521	1,170,320	136,388	309,938	5,538	309	538,284	154,711	25,152	39
3,097,898	44,200	.....	242,676	1,400	.....	19,591	7,630	10,421	67	.....	1,213	260	.....	40
5,097,354	94,600	31,200	.....	14,000	48,000	10,480	1,666	8,273	35	20	.....	400	86	41
5,456,878	249,600	.....	205,800	.....	96,000	13,243	932	8,693	260	.....	2,608	.....	750	42
29,013,280	424,160	.....	1,183,000	1,982,000	597,800	101,888	8,078	38,472	283	.....	10,142	41,018	3,895	43
25,896,762	735,300	74,880	641,700	4,000	240,000	65,642	8,195	46,883	602	24	8,698	40	1,200	44
426,440	2,087,200	.....	144,000	.....	172,800	11,457	2,370	1,563	2,470	.....	3,287	.....	1,767	45
5,201,440	.....	.....	1,159,200	.....	.....	29,363	850	10,093	.....	.....	18,420	.....	.....	46
11,371,748	386,880	30,000	673,880	70,000	60,000	25,482	3,347	14,426	255	18	6,211	1,000	225	47
7,145,632	.....	.....	186,400	.....	10,800	22,542	5,544	13,586	.....	.....	3,372	.....	40	48
5,257,986	26,000	.....	64,200	.....	20,400	11,171	1,979	8,843	30	.....	224	.....	95	49
34,179,842	13,843,000	.....	620,300	82,500	1,991,400	96,609	9,018	50,648	15,615	.....	4,141	4,990	12,197	50
1,027,000	.....	.....	.....	.....	.....	1,756	313	1,443	.....	.....	.....	.....	.....	51

TABLE 8.—NUMBER OF NEWSPAPERS AND PERIODICALS PUBLISHED IN DIFFERENT LANGUAGES

	STATES AND TERRITORIES.	NUMBER OF PUBLICATIONS IN EXISTENCE DURING THE CENSUS YEAR, CLASSIFIED ACCORDING TO LANGUAGE.															
		Total.	Armenian.	Bohemian.	Bohemian and English.	Chinese.	Dutch.	English.	Finnish.	French.	French and English.	Gaelic.	Gaelic and English.	German.	German and English.	German and Hebrew.	Hebrew.	Hungarian.
1	The United States	17,616	1	25	1	3	18	16,457	4	43	6	1	3	790	30	4	6	2
2	Alabama	177						177										
3	Arizona	35						34										
4	Arkansas	193						191						2				
5	California	555				3		515		6				17	2			
6	Colorado	257						251						5				
7	Connecticut	180						171						9				
8	Delaware	41						39						2				
9	District of Columbia	48						46						2				
10	Florida	122						121										
11	Georgia	279						278						1				
12	Idaho	48						48										
13	Illinois	1,416		7			1	1,270		2			1	81	8		1	
14	Indiana	680						646						33	1			
15	Indian territory	13						12										
16	Iowa	804		1			3	750						40				
17	Kansas	786						768						14	2			
18	Kentucky	270						264						6				
19	Louisiana	173						154		7	4			5				
20	Maine	172						172										
21	Maryland	170						161						9				
22	Massachusetts	668						641		13	1		1	10				
23	Michigan	657					9	606	2	3				27	1			
24	Minnesota	445						389	1	2				18				
25	Mississippi	161						161										
26	Missouri	803		1				754						41	2			
27	Montana	61						60						1				
28	Nebraska	550		3				522						16				
29	Nevada	25						25										
30	New Hampshire	127						123		2				2				
31	New Jersey	318					1	292		1				24				
32	New Mexico	41						33										
33	New York	1,938	1	4				1,772		5		1	1	111		4	3	1
34	North Carolina	176						176										
35	North Dakota	112						105			1			1	1			
36	Ohio	1,093		2				982	1					104	2			
37	Oklahoma	30						30										
38	Oregon	137						132						3				
39	Pennsylvania	1,476						1,372		1				87	5		2	1
40	Rhode Island	72						69		1				1				
41	South Carolina	100						98						2				
42	South Dakota	227			1		1	220						3	1			
43	Tennessee	254						250						4				
44	Texas	512		2				494						11				
45	Utah	39						36						1				
46	Vermont	76						76										
47	Virginia	231						227						4				
48	Washington	172						163						3				
49	West Virginia	144						142						2				
50	Wisconsin	521		5			3	409						87	5			
51	Wyoming	31						30						1				

a Choctaw.

IN EXISTENCE, REPORTING AND NOT REPORTING, BY STATES AND TERRITORIES: 1890.

NUMBER OF PUBLICATIONS IN EXISTENCE DURING THE CENSUS YEAR, CLASSIFIED ACCORDING TO LANGUAGE—continued.														NUMBER OF PUBLICATIONS REPORTING, CLASSIFIED ACCORDING TO LANGUAGE.								
Indian (a) and English.	Italian.	Italian and English.	Lithuanian.	Polish.	Portuguese.	Scandinavian. (b)	Slavonic, unspecified.	Spanish.	Spanish and English.	Volapuk.	Volapuk and English.	Welsh.	Welsh and English.	Total.	Armenian.	Bohemian.	Bohemian and English.	Chinese.	Dutch.	English.	Finnish.	
1	14	2	1	22	2	130	2	33	7	2	1	4	1	14,901	1	22	1	3	16	13,848	4	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	136	.....	.....	.....	.....	.....	136	.....	2
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	29	.....	.....	.....	.....	.....	28	.....	3
.....	4	.....	.....	.....	1	2	.....	4	1	.....	.....	.....	.....	164	.....	.....	.....	.....	.....	162	.....	4
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	455	.....	.....	.....	3	.....	418	.....	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	186	.....	.....	.....	.....	.....	182	.....	6
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	156	.....	.....	.....	.....	.....	148	.....	7
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	.....	.....	.....	.....	.....	30	.....	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17	.....	.....	.....	.....	.....	15	.....	9
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	97	.....	.....	.....	.....	.....	97	.....	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	230	.....	.....	.....	.....	.....	229	.....	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33	.....	.....	.....	.....	.....	33	.....	12
.....	2	1	.....	9	.....	32	.....	1	.....	.....	.....	.....	.....	1,241	.....	5	.....	.....	1	1,114	.....	13
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	620	.....	.....	.....	.....	.....	587	.....	14
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	.....	.....	.....	.....	.....	8	.....	15
.....	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	.....	.....	703	.....	1	.....	.....	3	655	.....	16
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	693	.....	.....	.....	.....	.....	676	.....	17
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	218	.....	.....	.....	.....	.....	212	.....	18
.....	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	129	.....	.....	.....	.....	.....	111	.....	19
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	146	.....	.....	.....	.....	.....	146	.....	20
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	124	.....	.....	.....	.....	.....	117	.....	21
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	568	.....	.....	.....	.....	.....	542	.....	22
.....	.....	.....	.....	3	.....	6	.....	.....	.....	.....	.....	.....	.....	589	.....	.....	.....	.....	8	540	2	23
.....	.....	.....	.....	2	.....	33	.....	.....	.....	.....	.....	.....	.....	392	.....	.....	.....	.....	.....	338	1	24
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	119	.....	.....	.....	.....	.....	119	.....	25
.....	.....	.....	.....	.....	.....	2	.....	2	1	.....	.....	.....	.....	707	.....	1	.....	.....	.....	661	.....	26
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52	.....	.....	.....	.....	.....	51	.....	27
.....	.....	.....	.....	.....	.....	9	.....	.....	.....	.....	.....	.....	.....	446	.....	2	.....	.....	.....	425	.....	28
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	.....	.....	.....	.....	.....	15	.....	29
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	111	.....	.....	.....	.....	.....	107	.....	30
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	263	.....	.....	.....	.....	1	240	.....	31
.....	.....	.....	.....	.....	.....	.....	.....	5	3	.....	.....	.....	.....	34	.....	.....	.....	.....	.....	26	.....	32
.....	5	.....	.....	4	1	7	.....	14	.....	.....	.....	4	.....	1,627	1	4	.....	.....	.....	1,475	.....	33
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	135	.....	.....	.....	.....	.....	135	.....	34
.....	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	87	.....	.....	.....	.....	.....	80	.....	35
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	932	.....	2	.....	.....	.....	825	1	36
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	.....	.....	.....	.....	.....	21	.....	37
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	126	.....	.....	.....	.....	.....	122	.....	38
.....	2	.....	1	1	.....	2	2	.....	.....	.....	.....	.....	.....	1,271	.....	.....	.....	.....	.....	1,175	.....	39
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	54	.....	.....	.....	.....	.....	52	.....	40
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	.....	.....	.....	.....	.....	82	.....	41
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	174	.....	.....	1	.....	.....	170	.....	42
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	219	.....	.....	.....	.....	.....	215	.....	43
.....	.....	.....	.....	.....	.....	.....	.....	3	2	.....	.....	.....	.....	437	.....	2	.....	.....	.....	420	.....	44
.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	28	.....	.....	.....	.....	.....	28	.....	45
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	.....	.....	.....	.....	.....	70	.....	46
.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	185	.....	.....	.....	.....	.....	182	.....	47
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	144	.....	.....	.....	.....	.....	135	.....	48
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	112	.....	.....	.....	.....	.....	110	.....	49
.....	.....	.....	.....	2	.....	10	.....	.....	.....	.....	.....	.....	.....	456	.....	5	.....	.....	3	358	.....	50
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	.....	.....	.....	.....	.....	25	.....	51

b Embraces Norwegian, Swedish, and Danish publications.

TABLE 8.—NUMBER OF NEWSPAPERS AND PERIODICALS PUBLISHED IN DIFFERENT LANGUAGES

	STATES AND TERRITORIES.	NUMBER OF PUBLICATIONS REPORTING, CLASSIFIED ACCORDING TO LANGUAGE—continued.																
		French.	French and English.	Gaelic.	Gaelic and English.	German.	German and English.	German and Hebrew.	Hebrew.	Hungarian.	Indian (a) and English.	Italian.	Italian and English.	Lithuanian.	Polish.	Portuguese.	Scandinavian.	Slavonic, unspecified.
1	The United States	40	5	1	3	727	27	4	5	1	1	13	1	1	18	2	112	2
2	Alabama																	
3	Arizona																	
4	Arkansas					2												
5	California	5				15	2					4				1	2	
6	Colorado					3												
7	Connecticut					8												
8	Delaware					2												
9	District of Columbia					2												
10	Florida																	
11	Georgia					1												
12	Idaho																	
13	Illinois	2			1	76	7		1			2			6		26	
14	Indiana					32	1											
15	Indian territory										1							
16	Iowa					35											9	
17	Kansas					14	1										1	
18	Kentucky					6												
19	Louisiana	7	3			5						1	1					
20	Maine																	
21	Maryland					7												
22	Massachusetts	13	1		1	9											1	
23	Michigan	3				27	1								2		6	
24	Minnesota	2				17									2		32	
25	Mississippi																	
26	Missouri					38	2										2	
27	Montana					1												
28	Nebraska					14											5	
29	Nevada																	
30	New Hampshire	2				2												
31	New Jersey	1				21												
32	New Mexico																	
33	New York	4		1	1	103		4	2	1		4			4	1	6	
34	North Carolina																	
35	North Dakota		1			1	1										4	
36	Ohio					100	2								1			
37	Oklahoma																	
38	Oregon					3											1	
39	Pennsylvania	1				80	5		2			2		1	1		2	2
40	Rhode Island					1											1	
41	South Carolina					2												
42	South Dakota					2	1											
43	Tennessee					4												
44	Texas					10												
45	Utah																	
46	Vermont																	
47	Virginia					3												
48	Washington					3											6	
49	West Virginia					2												
50	Wisconsin					76	4								2		8	
51	Wyoming																	

a Choctaw.

IN EXISTENCE, REPORTING AND NOT REPORTING, BY STATES AND TERRITORIES: 1890—Continued.

NUMBER OF PUBLICATIONS REPORTING, CLASSIFIED ACCORDING TO LANGUAGE—continued.						NUMBER OF PUBLICATIONS IN EXISTENCE BUT NOT REPORTING, CLASSIFIED ACCORDING TO LANGUAGE.																
Spanish.	Spanish and English.	Volapuk.	Volapuk and English.	Welsh.	Welsh and English.	Total.	Bohemian.	Dutch.	English.	French.	French and English.	German.	German and English.	Hebrew.	Hungarian.	Italian.	Italian and English.	Polish.	Scandinavian. (b)	Spanish.	Volapuk.	
29	7	1	1	4	1	2,715	3	2	2,609	3	1	63	3	1	1	1	1	4	18	4	1	1
						41			41													2
1						6			6													3
						29			29													4
4	1					100			97	1		2										5
1						71			69			2										6
						24			23			1										7
						9			9													8
						31			31													9
						25			24											1		10
						49			49													11
						15			15													12
						175	2		156			5	1				1	3	6	1		13
						60			59			1										14
						4			4													15
						101			95			5							1			16
					1	93			92				1									17
						52			52													18
1						44			43		1											19
						26			26													20
						46			44			2										21
		1				100			99			1										22
						68		1	66									1				23
						53			51			1							1			24
						42			42													25
2	1					96			93			3										26
						9			9													27
						104	1		97			2							4			28
						10			10													29
						16			16													30
						55			52			3										31
5	3					7			7													32
12				4		311			297	1		8		1		1			1	2		33
						41			41													34
						25			25													35
			1			161			157			4										36
						9			9													37
						11			10												1	38
						205			197			7			1							39
						18			17	1												40
						16			16													41
						53		1	50			1							1			42
						35			35													43
3	2					75			74			1										44
						11			8			1							2			45
						6			6													46
						46			45			1										47
						28			28													48
						32			32													49
						65			51			11	1						2			50
						6			5			1										51

b Embraces Norwegian, Swedish, and Danish publications.

GAS.

GAS.

This report presents the statistics concerning the manufacture of gas for the year beginning July 1, 1889, and ending June 30, 1890, as conducted by 742 establishments, from which complete reports were received. The reports for the census of 1880 contain no data respecting the manufacture of gas, although the industry appears in the reports from 1850 to 1870, inclusive. The following comparative summary presents the statistics concerning the manufacture of gas given at previous censuses and the totals under the general heads of the census inquiry of 1890:

COMPARATIVE SUMMARY, GAS MANUFACTURE: 1850 TO 1890.

ITEMS.	1850	1860	1870 (a)	1880 (b)	1890
Number of establishments reporting	30	221	390		742
Capital	$6,674,000	$28,848,726	$71,773,694		$258,771,795
Miscellaneous expenses	(c)	(c)	(c)		$7,799,385
Average number of employés (aggregate)	952	5,730	8,723		14,860
Total wages	$390,684	$2,321,536	$6,546,734		$10,642,794
Officers, firm members, and clerks:					
Average number	(d)	(d)	(d)		1,864
Total wages	(d)	(c)	(c)		$2,143,109
All other employés:					
Average number	(d)	(d)	(d)		12,996
Total wages	(d)	(d)	(d)		$8,499,625
Cost of materials used	$503,074	$3,667,630	$10,869,373		$14,037,087
Value of products	$1,921,746	$12,016,353	$32,048,851		$56,987,290

a The values for 1870 are expressed in a currency which was at a great discount in gold.
b Statistics not reported for 1880.
c Not reported.
d Not reported separately.

While figures are not available to ascertain the increase during the 10 years from 1880 to 1890, the data presented in the above summary partially indicate the changes that have taken place in the industry during the 40 years from 1850 to 1890. Over 250 companies, many of them controlling large establishments, known to have been in existence and engaged in the manufacture of gas during the census year 1890, failed to furnish the information required for census purposes. The figures for the Eleventh Census therefore can not be considered as representing the totals for the manufacture of gas in the United States during that year. It is probable that at previous censuses the office experienced difficulty in securing the desired information and that some establishments were not accounted for or failed to give complete data for all the items. Without making allowance for omissions of this character, it appears that from 1850 to 1890 the number of establishments has increased 712; the capital has increased $252,097,795, or 3,777.31 per cent; the cost of materials used, $13,534,013, or 2,690.26 per cent, and the value of products, $55,065,544, or 2,865.39 per cent.

The 742 establishments from which returns were received in 1890 are found in 714 localities. The following statement gives the names of the localities and the number of establishments in each locality from which returns were received:

NUMBER OF ESTABLISHMENTS IN EACH LOCALITY, GAS MANUFACTURE: 1890.

Adams, Mass	1	Ann Arbor, Mich	1	Attleboro, Mass	1	Bay city, Mich	1
Adrian, Mich	1	Anniston, Ala	1	Augusta, Ga	1	Bayonne, N. J	1
Akron, Ohio	2	Appleton, Wis	1	Augusta, Me	1	Beatrice, Neb	1
Albany, N. Y	1	Arkansas city, Kan	1	Aurora, Ill	1	Belfast, Me	1
Albion, N. Y	1	Arlington, Mass	1	Aurora, Ind	1	Bellaire, Ohio	1
Albuquerque, N. M	1	Ashland, Ohio	1	Aurora, N. Y	1	Bellefontaine, Ohio	1
Allegheny, Pa	1	Ashland, Pa	1	Austin, Tex	1	Belleville, Ill	1
Allentown, Pa	1	Ashtabula, Ohio	1	Ballston Spa, N. Y	1	Beloit, Wis	1
Alliance, Ohio	1	Astoria, Ore	1	Baltimore, Md	1	Benicia, Cal	1
Alpena, Mich	1	Atchison, Kan	1	Bangor, Me	1	Benton Harbor, Mich	1
Alton, Ill	1	Athens, Ga	1	Baraboo, Wis	1	Bethlehem, Pa	1
Altoona, Pa	1	Athens, Ohio	1	Barnesville, Ohio	1	Beverly, Mass	1
Amesbury, Mass	1	Athol, Mass	1	Batavia, N. Y	1	Big Rapids, Mich	1
Amherst, Mass	1	Atlanta, Ga	2	Bath, Me	1	Binghamton, N. Y	1
Amsterdam, N. Y	1	Atlantic, Iowa	1	Bath, N. Y	1	Birmingham, Ala	1
Anderson, Ind	1	Attica, N. Y	1	Baton Rouge, La	1	Boonville, Mo	1

NUMBER OF ESTABLISHMENTS IN EACH LOCALITY, GAS MANUFACTURE: 1890—Continued.

Boston, Mass	4	Corry, Pa	1	Geneva, N. Y	1	Kankakee, Ill	1
Braddock, Pa	1	Cortland, N. Y	1	Georgetown, Colo	1	Kansas city, Kan	1
Brattleboro, Vt	1	Cottage city, Mass	1	Georgetown, Ky	1	Kansas city, Mo	1
Bridgeport, Conn	1	Covington, Ky	1	Gettysburg, Pa	1	Kearney, Neb	1
Bridgeton, N. J	1	Creston, Iowa	1	Gilroy, Cal	1	Keene, N. H	1
Bristol, Pa	1	Cumberland, Md	1	Girardville, Pa	1	Kenosha, Wis	1
Bristol, R. I	1	Dallas, Tex	1	Glendale, Ohio	1	Kenton, Ohio	1
Brockport, N. Y	1	Dalton, Ga	1	Glens Falls, N. Y	1	Keokuk, Iowa	1
Brockton, Mass	1	Danbury, Conn	1	Gloucester, Mass	1	Key West, Fla	1
Brookline, Mass	1	Dansville, N. Y	1	Gloucester, N. J	1	Killingly, Conn	1
Brooklyn, N. Y	4	Danvers, Mass	1	Goshen, N. Y	1	Knoxville, Tenn	1
Brownsville, Pa	1	Danville, Ill	1	Grand Forks, N. D	1	Kokomo, Ind	1
Brownsville, Tenn	1	Danville, Ky	1	Grand Haven, Mich	1	Laconia, N. H	1
Brunswick, Ga	1	Davenport, Iowa	1	Grand Island, Neb	1	Lacrosse, Wis	1
Brunswick, Me	1	Dayton, Ohio	1	Grand Rapids, Mich	1	Lafayette, Ind	1
Bucyrus, Ohio	1	Decatur, Ill	1	Grass Valley, Cal	1	Lambertville, N. J	1
Buffalo, N. Y	3	Dedham, Mass	1	Great Barrington, Mass	1	Lancaster, Pa	1
Burlington, Iowa	1	Delaware, Ohio	1	Great Falls, N. H	1	Lansing, Mich	1
Burlington, N. J	1	Delphos, Ohio	1	Green Bay, Wis	1	Laporte, Ind	1
Burlington, Vt	1	Denison, Tex	1	Greenbush, N. Y	1	Lasalle, Ill	1
Cadiz, Ohio	1	Denver, Colo	1	Greencastle, Ind	1	Las Vegas, N. M	1
Cairo, Ill	1	Detroit, Mich	1	Greenfield, Mass	1	Lawrence, Kan	1
Calais, Me	1	Dixon, Ill	1	Greensburg, Ind	1	Lawrence, Mass	1
Cambridge, Mass	1	Dorchester, Mass	1	Greensburg, Pa	1	Lawrenceburg, Ind	1
Cambridge, Md	1	Dover, Del	1	Greenville, Ohio	1	Leadville, Colo	1
Camden, N. J	1	Dover, N. H	1	Greenville, Pa	1	Leavenworth, Kan	1
Canandaigua, N. Y	1	Dubuque, Iowa	1	Gunnison, Colo	1	Lebanon, Ind	1
Canton, Ill	1	Duluth, Minn	1	Hackensack, N. J	1	Lebanon, Ky	1
Canton, Ohio	1	Dunkirk, N. Y	1	Hagerstown, Md	1	Lebanon, Pa	1
Cape May, N. J	1	Easthampton, Mass	1	Hamilton, Ohio	1	Lee, Mass	1
Carbondale, Pa	1	Easton, Pa	1	Hannibal, Mo	1	Leominster, Mass	1
Carlinville, Ill	1	East Portland, Ore	1	Hanover, N. H	1	Leroy, N. Y	1
Carlisle, Pa	1	Eastport, Me	1	Hanover, Pa	1	Lewisburg, Pa	1
Carson city, Nev	1	Eauclaire, Wis	1	Harrisburg, Pa	1	Lewiston, Me	1
Cartersville, Ga	1	Eldorado, Kan	1	Hartford, Conn	1	Lewistown, Pa	1
Carthage, Mo	1	Elizabeth, N. J	1	Hastings, Neb	1	Lexington, Ky	1
Catasauqua, Pa	1	Elkhart, Ind	1	Hastings upon Hudson, N. Y	1	Lexington, Mass	1
Catskill, N. Y	1	Elmira, N. Y	1	Haverhill, Mass	1	Lexington, Mo	1
Cedar Rapids, Iowa	1	Elyria, Ohio	1	Haverstraw, N. Y	1	Lincoln, Neb	1
Centralia, Ill	1	Englewood, N. J	1	Hazleton, Pa	1	Little Rock, Ark	1
Chambersburg, Pa	1	Erie, Pa	1	Healdsburg, Cal	1	Livermore, Cal	1
Champaign, Ill	1	Eufaula, Ala	1	Helena, Ark	1	Lockport, N. Y	1
Charleston, S. C	1	Eureka, Cal	1	Helena, Mont	1	Logan, Ohio	1
Charleston, W. Va	1	Eureka Springs, Ark	1	Hempstead, N. Y	1	Logansport, Ind	1
Charlestown, Mass	1	Evansville, Ind	1	Henderson, Ky	1	Long Branch, N. J	1
Charlestown, W. Va	1	Exeter, N. H	1	Herkimer, N. Y	1	Long Island city, N. Y	1
Charlotte, Mich	1	Fall River, Mass	2	Hoboken, N. J	1	Los Angeles, Cal	1
Charlotte, N. C	1	Fargo, N. D	1	Hollidaysburg, Pa	1	Los Gatos, Cal	1
Charlottesville, Va	1	Faribault, Minn	1	Hollister, Cal	1	Louisiana, Mo	1
Chattanooga, Tenn	1	Farmington, N. H	1	Holyoke, Mass	1	Lowell, Mass	1
Chelsea, Mass	1	Fergus Falls, Minn	1	Hoosick Falls, N. Y	1	Lynchburg, Va	1
Chester, Pa	1	Fishkill on Hudson, N. Y	1	Hopkinsville, Ky	1	Lynn, Mass	1
Cheyenne, Wyo	1	Fitchburg, Mass	1	Hot Springs, Ark	1	Lyons, N. Y	1
Chicago, Ill	4	Flatbush, N. Y	1	Houston, Tex	1	McKeesport, Pa	1
Chico, Cal	1	Flint, Mich	1	Hudson, N. Y	1	Macon, Ga	1
Chicopee, Mass	1	Flushing, N. Y	1	Huntington, Conn	1	Madison, Ind	1
Chicopee Falls, Mass	1	Fond du Lac, Wis	1	Huntsville, Ala	1	Mahanoy, Pa	1
Chillicothe, Ohio	1	Fort Dodge, Iowa	1	Huntsville, Mo	1	Malden, Mass	1
Circleville, Ohio	1	Fort Plain, N. Y	1	Ilion, N. Y	1	Manchester, N. H	1
Claremont, N. H	1	Fort Scott, Kan	1	Independence, Iowa	1	Manistee, Mich	1
Clarksville, Tenn	1	Fort Smith, Ark	1	Independence, Mo	1	Mansfield, Ohio	1
Clearfield, Pa	1	Fort Wayne, Ind	1	Indianapolis, Ind	1	Marblehead, Mass	1
Cleveland, Ohio	2	Fort Worth, Tex	1	Ionia, Mich	1	Marion, Ohio	1
Clinton, Iowa	1	Frankfort, Ind	1	Iowa city, Iowa	1	Marlboro, Mass	1
Clinton, Mo	1	Frankfort, Ky	1	Ipswich, Mass	1	Marquette, Mich	1
Clinton, Mass	1	Franklin, Ind	1	Ithaca, N. Y	1	Marshall, Mich	1
Clyde, N. Y	1	Franklin, Pa	1	Jackson, Cal	1	Marshall, Mo	1
Coatesville, Pa	1	Franklin Falls, N. H	1	Jackson, Miss	1	Marshall, Tex	1
Cohoes, N. Y	1	Frederick, Md	1	Jacksonville, Fla	1	Marshalltown, Iowa	1
Coldwater, Mich	1	Fredericksburg, Va	1	Jacksonville, Ill	1	Martinez, Cal	1
College Point, N. Y	1	Freehold, N. J	1	Jamaica Plain, Mass	1	Marysville, Cal	1
Columbia, Pa	1	Freeport, Ill	1	Jamaica, N. Y	1	Massillon, Ohio	1
Columbia, S. C	1	Fremont, Neb	1	Jamestown, N. Y	1	Matawan, N. J	1
Columbus, Ga	1	Fremont, Ohio	1	Janesville, Wis	1	Mattoon, Ill	1
Columbus, Ind	1	Frostburg, Md	1	Jefferson city, Mo	1	Mauch Chunk, Pa	1
Columbus, Ohio	1	Gainesville, Fla	1	Jeffersonville, Ind	1	Maysville, Ky	1
Colusa, Cal	1	Galesburg, Ill	1	Jersey city, N. J	1	Meadville, Pa	1
Concord, N. H	1	Galion, Ohio	1	Jersey Shore, Pa	1	Mechanicsburg, Ohio	1
Coney Island, N. Y	1	Gallipolis, Ohio	1	Johnstown, N. Y	1	Mechanicsburg, Pa	1
Connellsville, Pa	1	Galva, Ill	1	Johnstown, Pa	1	Media, Pa	1
Connersville, Ind	1	Galveston, Tex	1	Joliet, Ill	1	Medina, N. Y	1
Cooperstown, N. Y	1	Gardner, Mass	1	Joplin, Mo	1	Memphis, Tenn	1
Corning, N. Y	1	Geneseo, N. Y	1	Kalamazoo, Mich	1	Mendota, Ill	1

NUMBER OF ESTABLISHMENTS IN EACH LOCALITY, GAS MANUFACTURE: 1890—Continued.

Merced, Cal. 1	Oshkosh, Wis. 1	Saco, Me. 1	Tombstone, Ariz. 1
Meriden, Conn. 1	Oskaloosa, Iowa. 1	Sacramento, Cal. 1	Tonawanda, N. Y. 1
Michigan city, Ind. 1	Oswego, N. Y. 1	Sag Harbor, N. Y. 1	Topeka, Kan. 1
Middletown, Conn. 1	Ottawa, Ill. 1	Saginaw, Mich. 2	Towanda, Pa. 1
Middletown, N. Y. 1	Ottawa, Kan. 1	St. Albans, Vt. 1	Trenton, Mo. 1
Middletown, Ohio. 1	Ottumwa, Iowa. 1	St. Augustine, Fla. 1	Trenton, N. J. 1
Middletown, Pa. 1	Owego, N. Y. 1	St. Charles, Mo. 1	Trinidad, Colo. 1
Milford, Mass. 1	Owensboro, Ky. 1	St. Cloud, Minn. 1	Troy, N. Y. 1
Millville, N. J. 1	Owosso, Mich. 1	St. Helena, Cal. 1	Troy, Ohio. 1
Milton, Pa. 1	Paducah, Ky. 1	St. Johns, Mich. 1	Tucson, Ariz. 1
Milwaukee, Wis. 1	Painesville, Ohio. 1	St. Johnsbury, Vt. 1	Tulare, Cal. 1
Minneapolis, Minn. 1	Palatka, Fla. 1	St. Joseph, Mo. 1	Upper Sandusky, Ohio. 1
Mobile, Ala. 1	Palmyra, N. Y. 1	St. Louis, Mo. 1	Urbana, Ohio. 1
Modesto, Cal. 1	Paris, Ky. 1	St. Paul, Minn. 1	Utica, N. Y. 1
Moline, Ill. 1	Passaic, N. J. 1	Salem, Mass. 1	Vallejo, Cal. 1
Monmouth, Ill. 1	Paterson, N. J. 1	Salem, N. J. 1	Valparaiso, Ind. 1
Monroe, Mich. 1	Pawtucket, R. I. 1	Salem, N. C. 1	Van Wert, Ohio. 1
Montpelier, Vt. 1	Peekskill, N. Y. 1	Salem, Ohio. 1	Vicksburg, Miss. 1
Morristown, N. J. 1	Pekin, Ill. 1	Salem, Ore. 1	Vincennes, Ind. 1
Mount Holly, N. J. 1	Pensacola, Fla. 1	Salina, Kan. 1	Vineland, N. J. 1
Mount Joy, Pa. 1	Peoria, Ill. 1	Salinas, Cal. 1	Virginia city, Nev. 1
Mount Pleasant, Iowa. 1	Perth Amboy, N. J. 1	Salisbury, N. C. 1	Visalia, Cal. 1
Mount Pleasant, Pa. 1	Peru, Ind. 1	Salt Lake, Utah. 1	Wabash, Ind. 1
Mount Sterling, Ky. 1	Petaluma, Cal. 1	San Bernardino, Cal. 1	Waco, Tex. 1
Mount Vernon, Ohio. 1	Petersburg, Va. 1	San Buena Ventura, Cal. 1	Wakefield, Mass. 1
Muncie, Ind. 1	Philadelphia, Pa. 2	San Diego, Cal. 1	Wallawalla, Wash. 1
Murfreesboro, Tenn. 1	Phillipsburg, N. J. 1	Sanford, Fla. 1	Wallingford, Conn. 1
Muscatine, Iowa. 1	Pierre, S. D. 1	San Francisco, Cal. 2	Waltham, Mass. 1
Muskegon, Mich. 1	Pine Bluff, Ark. 1	San Jose, Cal. 1	Wapakoneta, Ohio. 1
Nantucket, Mass. 1	Piqua, Ohio. 1	San Leandro, Cal. 1	Wappingers Falls, N. Y. 1
Napa, Cal. 1	Pittsburg, Pa. 3	San Rafael, Cal. 1	Ware, Mass. 1
Nashua, N. H. 1	Pittsfield, Mass. 2	Santa Barbara, Cal. 1	Warren, Ohio. 1
Nashville, Tenn. 1	Pittston, Pa. 1	Santa Cruz, Cal. 1	Warren, R. I. 1
Natick, Mass. 1	Plainfield, N. J. 1	Saratoga Springs, N. Y. 1	Warsaw, N. Y. 1
Nebraska city, Neb. 1	Plattsburg, N. Y. 1	Savannah, Ga. 1	Washington, D. C. 2
Negaunee, Mich. 1	Plattsmouth, Neb. 1	Schenectady, N. Y. 1	Washington, Ind. 1
Nevada city, Cal. 1	Plymouth, Mass. 1	Schuylkill Haven, Pa. 1	Washington, Ohio. 1
New Albany, Ind. 1	Plymouth, Pa. 1	Scranton, Pa. 1	Waterbury, Conn. 1
Newark, N. J. 1	Portage, Wis. 1	Seattle, Wash. 1	Waterloo, Iowa. 1
Newark, Ohio. 1	Port Henry, N. Y. 1	Selma, Ala. 1	Watertown, Wis. 1
New Bedford, Mass. 1	Port Huron, Mich. 1	Seneca Falls, N. Y. 1	Waterville, N. Y. 1
Newbern, N. C. 1	Port Jervis, N. Y. 1	Seymour, Ind. 1	Watkins, N. Y. 1
New Britain, Conn. 1	Portland, Me. 1	Shamokin, Pa. 1	Watsonville, Cal. 1
New Brunswick, N. J. 1	Portland, Ore. 1	Sharon, Pa. 1	Wausau, Wis. 1
Newburg, N. Y. 1	Portsmouth, N. H. 1	Sharpsburg, Pa. 1	Waverly, N. Y. 1
Newburyport, Mass. 1	Portsmouth, Ohio. 1	Sheboygan, Wis. 1	Waynesboro, Pa. 1
Newcastle, Del. 1	Portsmouth, Va. 1	Shelbyville, Ind. 1	Webster, Mass. 1
Newcastle, Ind. 1	Pottstown, Pa. 1	Shelbyville, Ky. 1	Wellsville, Ohio. 1
New Decatur, Ala. 1	Pottsville, Pa. 1	Shippensburg, Pa. 1	West Chester, Pa. 1
New Hartford, Conn. 1	Poughkeepsie, N. Y. 1	Shreveport, La. 1	Westerly, R. I. 1
New Haven, Conn. 1	Princeton, Ill. 1	Sidney, Ohio. 1	Westfield, Mass. 1
New London, Conn. 1	Princeton, N. J. 1	Singsing, N. Y. 1	Westminster, Md. 1
New Orleans, La. 2	Providence, R. I. 1	Sioux city, Iowa. 1	West Superior, Wis. 1
New Philadelphia, Ohio. 1	Pueblo, Colo. 1	Sioux Falls, S. D. 1	West Winsted, Conn. 1
Newport, R. I. 1	Pulaski, Tenn. 1	Smyrna, Del. 1	Wheeling, W. Va. 1
New Rochelle, N. Y. 1	Putnam, Conn. 1	South Bend, Ind. 1	Whitehall, N. Y. 1
Newton, Kan. 1	Quincy, Ill. 1	South Bethlehem, Pa. 1	White Plains, N. Y. 1
Newton, Mass. 1	Racine, Wis. 1	Southbridge, Mass. 1	Wilkesbarre, Pa. 1
Newton, N. J. 1	Rahway, N. J. 1	Spencer, Mass. 1	Williamsport, Pa. 1
Newtown, Pa. 1	Raleigh, N. C. 1	Springfield, Ill. 1	Williamstown, Mass. 1
New York, N. Y. 6	Ravenna, Ohio. 1	Springfield, Mass. 1	Willimantic, Conn. 1
Niagara Falls, N. Y. 1	Red Bank, N. J. 1	Springfield, Mo. 1	Wilmington, Del. 1
Norfolk, Va. 1	Red Bluff, Cal. 1	Springfield, Ohio. 1	Wilmington, N. C. 1
Norristown, Pa. 1	Redding, Cal. 1	Stamford, Conn. 1	Wilmington, Ohio. 1
North Adams, Mass. 1	Red Oak, Iowa. 1	Sterling, Ill. 1	Windsor, Vt. 1
Northampton, Mass. 1	Red Wing, Minn. 1	Stevens Point, Wis. 1	Winfield, Kan. 1
North Attleboro, Mass. 1	Rhinebeck, N. Y. 1	Stillwater, Minn. 1	Winona, Minn. 1
Norwalk, Conn. 1	Richmond, Ind. 1	Stockton, Cal. 1	Woburn, Mass. 1
Norwalk, Ohio. 1	Ripley, Ohio. 1	Stoughton, Mass. 1	Woodbury, N. J. 1
Norwich, Conn. 1	Riverside, Cal. 1	Streator, Ill. 1	Woodland, Cal. 1
Norwich, N. Y. 1	Rochester, Minn. 1	Syracuse, N. Y. 1	Woodstock, Vt. 1
Norwood, Mass. 1	Rockford, Ill. 1	Tacoma, Wash. 1	Woonsocket, R. I. 1
Nyack, N. Y. 1	Rock Island, Ill. 1	Tamaqua, Pa. 1	Wooster, Ohio. 1
Oakland, Cal. 1	Rockland, Me. 1	Tarrytown, N. Y. 1	Worcester, Mass. 1
Oberlin, Ohio. 1	Rockville, Conn. 1	Taunton, Mass. 1	York, Pa. 1
Oil city, Pa. 1	Rome, Ga. 1	Texarkana, Ark. 1	Youngstown, Ohio. 1
Olympia, Wash. 1	Rondout, N. Y. 1	Tiffin, Ohio. 1	Ypsilanti, Mich. 1
Omaha, Neb. 1	Roxbury, Mass. 1	Titusville, Pa. 1	Yreka, Cal. 1
Oneida, N. Y. 1	Royersford, Pa. 1	Toledo, Ohio. 1	Zanesville, Ohio. 1
Oroville, Cal. 1	Rutland, Vt. 1		

When two or more gas making plants, controlled by the same corporation, firm, or individual, are located in the same city they have been considered and counted as one establishment, except that in some instances individual returns may have been made for separate plants in the same city, and did not contain the necessary information to justify this consolidation In such cases the plants were counted as separate establishments.

CAPITAL.

The capital reported as employed in the manufacture of gas for the census year of 1890 amounts to $258,771,795. The several items forming this aggregate are shown in the following statement, with the percentage the amount given for each is of the total:

STATISTICS OF CAPITAL IN DETAIL AND PERCENTAGE EACH ITEM IS OF TOTAL, GAS MANUFACTURE: 1890.

ITEMS.	Amount.	Percentage of total.
Total	$258,771,795	100.00
Land	45,521,707	17.59
Buildings	35,048,435	13.54
Machinery, tools, and implements	153,830,910	59.45
Raw materials on hand	2,654,254	1.03
Stock in process and finished products on hand	1,914,136	0.74
Cash, bills and accounts receivable, and all sundries not elsewhere reported	19,802,353	7.65

The total shown in the above statement does not include the value of property held in tenancy and for which an annual rental of $630,711 is reported. The value of hired property was not reported. From the returns it appears that in 1890 it required $4.54 of capital to produce $1.00 of gross product. In 1870, $1.00 of product required $2.24 of capital; in 1860, $2.40, and in 1850, $3.47. Previous census inquiries required the total value of all capital to be reported in answer to a single question. It is believed the form of the question used at the census of 1890 developed more fully the amount of capital invested in the industry than was done at previous censuses, and this will account in part, at least, for the large increase.

The principal item reported for capital is machinery, tools, and implements, valued at $153,830,910, or 59.45 per cent of the total capital. This amount includes the value of gas making apparatus and machinery, gas holders, consumers' meters, mains and services, implements, tools, horses, and wagons.

The data presented in Table 2 concerning the length and size of street mains, the number and size of consumers' meters, the number and capacity of water and fuel gas generators, gas holders, station meters, regenerative lamps, etc., indicate to some extent the character of the investment of the amount shown under the head of machinery. The statistics concerning these items, however, must be accepted with some reservation, as complete answers were not made by all establishments.

There were 12,065.34 miles of street mains reported as owned or leased and in use during the census year. This is an average of 16.26 miles to each of the 742 establishments, or 16.90 miles to each of the cities for which reports were received. The increase in street mains during the year was reported as 416 miles and 2,602 feet. Of the various sizes of pipe reported the largest quantity, 18,298,884 feet, is shown for that of 3 inches in diameter. The largest size of pipe, 36 inches in diameter, of which there is 652 feet reported, is shown for only two states, Pennsylvania and Rhode Island. There are 995,619 consumers' meters reported as in use (including ordinary stock carryings), or an average of 1,342 to each establishment, or 1,394 to each city. The increase during the census year was 61,513 meters.

In addition to the items shown in the preceding statement the schedules of inquiry contained a series of questions designed to develop the total value of the capital stock, the number of shares, par and market value per share, amount paid in per share, also the total dividends declared during the census year, and whether the stock was owned by males or females, residents or nonresidents of the state. All of these questions were not answered with sufficient accuracy to justify the presentation of the data.

The totals for the United States for those questions that were answered with reasonable accuracy are summarized in the following statement:

CAPITAL STOCK, GAS MANUFACTURE: 1890.

Total value of capital stock	$229,746,552.00
Total number of shares	4,083,481
Average value per share	$56.26
Ownership of stock:	
Total number of shares	4,083,481
Number of shares issued	2,328,852
Number of shares owned by males	1,865,048
Number of shares owned by females	463,804
Number of shares owned by residents of state	1,644,390
Number of shares owned by nonresidents of state	659,303
Number of shares owned by residents of foreign countries	25,159
Number of shares remaining in treasury or not accounted for	1,754,629

The value of capital reported, $258,771,795, exceeds the value of capital stock by $29,025,243. This excess consists in part of reserve fund, and is also caused by the increase in value of investment and by the fact that some companies report that they had no capital stock.

The number of shares of capital stock (2,328,852) actually issued is 57.03 per cent of the total. There remained in the treasury, or unaccounted for, 1,754,629 shares. Of the total number of shares issued, 80.08 per cent was reported as owned by males, and 19.92 per cent by females. The total number of shares issued was distributed as follows: residents of the state in which the company issuing the stock was located, 70.61 per cent; nonresidents of the state, 28.31 per cent, and residents of foreign countries, 1.08 per cent.

MISCELLANEOUS EXPENSES.

Previous census reports contain no statistics concerning the cost of production other than wages and materials. The inquiry of 1890 was designed to embrace the entire cost of manufacture other than what is involved in interest on capital and depreciation of plant. To permit of such a presentation a series of questions pertaining to expenses of miscellaneous character were included in the schedules. The data obtained in answer to these questions are presented in the following statement, with the percentage the amount reported for each item is of the total:

MISCELLANEOUS EXPENSES AND PERCENTAGE EACH ITEM IS OF TOTAL, GAS MANUFACTURE: 1890.

ITEMS.	Amount.	Percentage of total.
Total	$7,799,385	100.00
Rent paid for tenancy	630,711	8.09
Taxes	2,227,122	28.56
Insurance	77,293	0.99
Repairs, ordinary, of buildings and machinery	1,926,283	24.70
Interest paid on cash used in the business	1,561,773	20.02
All sundries not elsewhere reported	1,376,203	17.64

Taxes is the largest item of the miscellaneous expenses reported, and is followed by the cost of ordinary repairs of buildings and machinery. The borrowed cash represented by the $1,561,773 paid as interest is included in the total capital shown for the industry, but as the schedule of inquiry contained no questions concerning the amount or mode of investment of borrowed cash, it is impossible to designate the items of capital in which it is included. Considering the average rate of interest as 5 per cent, the amount represents borrowed cash to the value of $31,235,460.

The amount, $1,926,283, reported as expended during the year for ordinary repairs of buildings and machinery does not include any expense for new equipment, nor does it include an allowance for depreciation; it, however, represents 1.02 per cent of the value of buildings and machinery.

EMPLOYÉS AND WAGES.

The average number of employés reported as engaged in the manufacture of gas during the census year was 14,860, while the wages paid amounted to $10,642,794. It is believed that the form of the questions respecting employés and wages used at the Eleventh Census has resulted in developing the true average number of employés and the total amount paid in wages more fully than was done at previous censuses. The figures therefore should not be considered as a correct indication of increase. The schedule used at the census of 1890 called for the total wages and the "Average number employed during the year", that is, the average number employed during the entire term of operation of each establishment during the census year. These data were required for the following classes of employés: first, operatives, engineers, and other skilled workmen, overseers and foremen or superintendents (not general superintendents or managers); second, officers or firm members; third, clerks; fourth, watchmen, laborers, teamsters, and other unskilled workmen. The average number of males above 16 years and children were required to be reported separately for classes 1 and 4. The average number of males and females were reported separately for class 2, and the average number of males above 16 years, females above 15 years, and children were reported separately for class 3. The schedule of inquiry also required the average number of males, females, and children to be reported at specified weekly rates of pay. The statistics concerning employés and wages are shown in detail in Table 1, accompanying this report. It is probable that the class of officers or firm members, and possibly clerks, were not reported, or not fully reported, at previous censuses; omitting the former class, the number of employés shows an increase over 1870 of 5,103, or 58.50 per cent. Reducing the wages reported for 1870 to a gold basis, there is an increase shown of $3,970,284, or 75.81 per cent.

The following statement shows the average number, total wages, and average annual earnings for males above 16 years, females above 15 years, and children, by classes:

AVERAGE NUMBER OF MALES ABOVE 16 YEARS, FEMALES ABOVE 15 YEARS, AND CHILDREN, WITH TOTAL WAGES AND AVERAGE ANNUAL EARNINGS PER EMPLOYÉ, BY CLASSES, GAS MANUFACTURE: 1890.

CLASSES.	MALES ABOVE 16 YEARS.			FEMALES ABOVE 15 YEARS.			CHILDREN.		
	Average number.	Total wages.	Average annual earnings.	Average number.	Total wages.	Average annual earnings.	Average number.	Total wages.	Average annual earnings.
Officers or firm members	1,026	$1,431,359	$1,395.09	8	$3,764	$470.50	.....	.....	.....
Clerks	784	689,137	879.00	46	18,909	411.07	.....	.....	.....
Operatives and skilled	7,650	5,558,130	726.55	.....	.....	.....	21	$3,815	$181.67
Unskilled	5,301	2,934,517	553.58	.....	.....	.....	17	2,263	133.12
Pieceworkers	1	150	150.00	.....	.....	.....	6	750	125.00

Of the total amount, $10,642,794, paid as wages, the "Office force" (officers or firm members and clerks) received $2,143,169, or 20.14 per cent, and all other employés $8,499,625, or 79.86 per cent. No females were reported as engaged in the industry in either 1870 or 1860. Two females are shown for 1850, as compared with 54 in 1890, 46 of whom are reported as clerks and 8 as officers or firm members.

The number of males above 16 years, females above 15 years, and children reported at specified weekly rates of wages are shown in the following statement:

AVERAGE NUMBER OF EMPLOYÉS AT DIFFERENT WEEKLY RATES OF WAGES, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK, GAS MANUFACTURE: 1890.

WEEKLY RATES OF WAGES.	AVERAGE NUMBER OF EMPLOYÉS.		
	Males above 16 years.	Females above 15 years.	Children.
Total	14,761	54	38
Under $5	289	10	37
$5 and over but under $6	256	7	1
$6 and over but under $7	502	9	.....
$7 and over but under $8	395	6	.....
$8 and over but under $9	660	6	.....
$9 and over but under $10	2,112	2	.....
$10 and over but under $12	3,212	8	.....
$12 and over but under $15	2,956	2	.....
$15 and over but under $20	2,543	3	.....
$20 and over but under $25	1,172	.....	.....
$25 and over	664	1	.....

MATERIALS USED.

The total cost of all materials used in the manufacture of gas is reported as $14,037,087, and represents 43.22 per cent of the cost of manufacture, miscellaneous expenses forming 24.01 per cent and wages 32.77 per cent. The quantities and values of the different kinds of material are shown in detail by totals for states and territories in Table 1.

The following statement presents, in a summary form, the cost of the principal items reported under materials and the percentage the amount shown for each is of the total cost of materials used:

COST OF DIFFERENT MATERIALS AND PERCENTAGE THE COST OF EACH IS OF TOTAL, GAS MANUFACTURE: 1890.

ITEMS.	Cost.	Percentage of total cost.
Total	$14,037,087	100.00
Coal	8,773,283	62.50
Slack	24,568	0.17
Coke	190,342	1.36
Crude oil	882,812	6.29
Prepared or gas oil	212,728	1.52
Naphtha	2,387,465	17.01
Natural gas	19,389	0.14
Oxide of iron	51,936	0.37
Lime	426,590	3.04
Fuel	524,249	3.73
All other materials	543,725	3.87

The cost of coal is the principal item of expense in the manufacture of gas, and forms 62.50 per cent of the total cost of all materials. The quantities and cost of the different varieties of coal are given in the accompanying tables. The cost of naphtha is the second largest item of expense under materials, forming 17.01 per cent of the total. The use of natural gas is reported in Indiana, New York, Ohio, and Pennsylvania, there being 153,992,364 feet returned as costing $19,389. The cost of wood consumed in the manufacture of wood gas is included in the $25,233 shown as the cost of wood under fuel in Table 1, as it was not practicable to make an accurate separation.

PRODUCTS AND MACHINERY.

The total gross value of all products reported for gas manufacture was $56,987,290. The distribution of this aggregate among the several items of product and the percentage the amount reported for each item is of the total is shown in the following statement:

VALUE OF PRODUCT AND PERCENTAGE THE AMOUNT REPORTED FOR EACH CLASS IS OF TOTAL, GAS MANUFACTURE: 1890.

ITEMS.	Value.	Percentage of total cost.
Total	$56,987,290	$100.00
Coal gas	28,325,745	49.71
Water gas	21,686,732	38.06
Oil gas	1,782,803	3.13
Wood gas	46,391	0.08
Fuel gas	25,160	0.04
Coke	3,868,924	6.79
Tar	992,565	1.74
Ammoniacal liquor	258,970	0.45

The total quantity of all kinds of gas manufactured is reported at 36,519,511,510 cubic feet, valued at $51,866,831, or $1.42 per 1,000 cubic feet. The quantity, value, and average value per 1,000 cubic feet for each kind of gas is shown in the following statement. The averages given in this statement are computed from the totals obtained from 742 establishments situated in different parts of the country, with many large establishments omitted, and should not be considered as indicating the price in any particular locality.

QUANTITY, VALUE, AND AVERAGE VALUE PER 1,000 CUBIC FEET OF EACH KIND OF GAS MANUFACTURED: 1890.

KINDS OF GAS.	Quantity.	Value.	Average value per 1,000 cubic feet.
Total	36,519,511,510	$51,866,831	$1.42
Coal gas	19,091,449,238	28,325,745	1.48
Water gas	16,289,044,897	21,686,732	1.33
Oil gas	962,585,650	1,782,803	1.85
Wood gas	13,527,725	46,391	3.43
Fuel gas	162,904,000	25,160	0.15

The average value per bushel for coke is shown as $0.068, and of coal tar and ammoniacal liquor per gallon $0.041 and $0.007, respectively.

The quantity and value of the different varieties of gas manufactured in each state and territory are given in detail in Table 1.

The $56,987,290 shown as the value of products is the total for all classes of products manufactured during the year. Of the quantities represented by this value, a certain quantity of gas and by-products is consumed at the offices and works, and a considerable quantity of gas goes to waste and is reported as "Not accounted for". The value of products consumed in this manner, and for which the establishments receive no money value, amounts to $7,319,326, or 12.84 per cent of the total. If the total value of products is reduced by this amount there remains $49,667,964 as the value of products manufactured and sold. This amount appears in Table 1 as the "Net value of products".

The total quantity of gas sold during the census year of 1890 is reported as 32,524,699,855 cubic feet, valued at $46,237,287, or $1.42 per 1,000 cubic feet. Of this amount, 32,113,949,939 cubic feet, valued at $45,836,469, or $1.43 per 1,000 cubic feet, was sold for illuminating purposes; 73,391,071 cubic feet, valued at $103,420, or $1.41 per 1,000 feet, for power, and 337,358,845 cubic feet, valued at $297,398, or $0.88 per 1,000 cubic feet, for fuel. The quantity sold for illuminating purposes constituted 98.74 per cent of the total quantity sold, the quantity sold for power 0.22 per cent, and the quantity sold for fuel 1.04 per cent. The quantity sold for city consumption is reported as 218,108,846 cubic feet, and the number of consumers as 699,323.

Table 2, accompanying this report, presents detailed statistics concerning capital stock, value of improvements, machinery, and plant, also as to gas made, number of consumers, and city consumption. This table also shows separately the quantity of gas sold for illuminating, for power, and for fuel.

The data given for capital stock has been referred to under the head of "Capital". The value of improvements made during the year amounts to $3,360,977, which is 1.78 per cent of the total value of buildings and machinery. The value of improvements includes improvements of every character to buildings, benches and retorts, generators, holders, mains, and machinery.

Photometers are shown to have been used at the office or works in each state and territory, the total number in use being given as 773, or an average of 1.04 for each establishment. The number reported at the works is 561 and at the offices 212.

There are 1,396 gas holders reported, with a total capacity of 168,937,789 cubic feet, an average of 1.88 holders for each establishment, with an average capacity for each establishment of 227,679 cubic feet. The total daily capacity of the gas making plants is reported as 133,710,444 cubic feet, or an average of 180,203 cubic feet for each establishment. If all the establishments reporting were in operation 365 days of the year the average quantity of gas manufactured each day would be 100,053,456 cubic feet, or 134,843 cubic feet per day for each establishment, the daily capacity of the works exceeding the actual output by 45,360 cubic feet, while the capacity of the holders exceeds the daily output by 92,836 cubic feet.

There are 507 water gas generators reported, with a total capacity per each 24 hours of 115,436,200 cubic feet, the average capacity for each generator being 227,685 cubic feet, while the average capacity for each 24 hours for the 18 fuel gas generators reported is 102,222 cubic feet.

As no statistics were published at the Tenth Census concerning the manufacture of gas, and those given for 1870 fail to show the quantity of gas manufactured, questions concerning the quantity made, the quantity sold

for city consumption, and the number of consumers during the years 1870 and 1880 were included in the schedule of inquiry adopted at the Eleventh Census. The answers to these questions are too incomplete to permit of the presentation of the data.

Table 1, accompanying this report, presents in detail all the statistics concerning the manufacture of gas as reported by the 742 establishments reporting. Table 2 shows the data reported for capital stock, characteristics of machinery and plant, also the number of consumers, quantity of gas sold, and the quantity sold for city consumption.

TABLE 1.—DETAILED STATEMENT, GAS MANUFACTURE,

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL.								
			Aggregate.	Value of plant.				Live assets.			
				Total.	Land.	Buildings.	Machinery, tools, and implements.	Total.	Raw materials.	Stock in process and finished products on hand.	Cash, bills and accounts receivable, and all sundries not elsewhere reported.
1	The United States	742	$258,771,795	$234,401,052	$45,521,707	$35,048,435	$153,830,910	$24,370,743	$2,654,254	$1,914,136	$19,802,353
2	Alabama	7	825,988	763,200	55,500	187,800	519,900	62,788	3,520	2,197	57,071
3	Arkansas	7	507,942	494,892	52,600	28,900	413,392	13,050	3,931	1,125	7,994
4	California	44	13,065,857	10,853,371	1,984,324	1,173,350	7,695,697	2,213,486	371,185	1,532,488	308,813
5	Colorado	6	1,277,262	1,226,780	135,000	177,775	914,005	50,482	10,180	2,144	38,158
6	Connecticut	20	4,456,409	4,042,455	358,000	415,500	3,268,955	413,954	74,118	7,598	332,238
7	Delaware	4	594,215	544,477	40,000	54,000	450,477	49,738	10,619	1,020	38,099
8	Florida	7	747,779	606,608	30,511	53,500	522,597	141,171	6,023	2,522	132,626
9	Georgia	11	1,588,466	1,486,071	239,300	148,626	1,098,145	102,395	19,046	2,907	80,442
10	Illinois	36	43,542,852	41,743,300	12,188,400	8,188,600	21,366,300	1,799,552	267,298	31,627	1,500,627
11	Indiana	33	3,014,226	2,759,175	134,100	249,300	2,375,775	255,051	67,740	10,323	176,988
12	Iowa	19	2,127,067	2,013,690	301,200	190,600	1,521,890	113,377	19,031	4,582	89,764
13	Kansas	12	1,153,228	1,104,167	98,480	104,500	901,187	49,061	20,799	2,039	26,223
14	Kentucky	14	952,258	882,850	67,900	123,500	691,450	69,408	16,300	2,500	50,518
15	Louisiana	4	2,822,240	2,742,500	230,000	76,000	2,436,500	79,740	8,200	2,250	69,290
16	Maine	11	894,189	847,194	95,203	199,800	552,191	46,995	10,745	2,479	33,771
17	Maryland	7	11,615,815	11,252,045	3,519,500	1,028,000	6,704,545	363,770	69,475	4,428	289,867
18	Massachusetts	72	26,063,751	23,774,015	3,633,827	5,132,376	14,947,812	2,289,736	315,671	100,839	1,873,226
19	Michigan	27	4,030,363	3,464,098	355,150	434,263	2,674,685	566,265	46,028	12,165	508,072
20	Minnesota	10	4,946,448	4,691,100	756,200	220,500	3,714,400	255,348	33,450	9,555	212,343
21	Missouri	17	9,024,950	8,185,796	772,450	687,500	6,725,846	839,154	78,108	17,167	743,879
22	Nebraska	9	1,721,530	1,656,622	244,200	176,500	1,235,922	64,908	7,493	2,582	54,833
23	New Hampshire	13	767,966	637,257	37,800	87,000	512,457	130,709	11,796	2,666	116,247
24	New Jersey	33	4,819,011	4,383,060	804,283	658,027	2,920,750	435,951	28,906	5,125	401,920
25	New York	94	77,899,876	67,117,519	13,126,410	9,768,878	44,222,231	10,782,357	747,421	54,318	9,980,618
26	North Carolina	6	333,618	312,550	26,500	21,500	264,550	21,068	4,125	575	16,368
27	Ohio	61	8,900,934	8,532,667	1,430,295	1,013,069	6,089,303	368,267	28,668	16,371	323,228
28	Oregon	4	1,203,262	1,158,500	284,000	421,500	453,000	44,762	28,622	6,940	9,200
29	Pennsylvania	73	9,353,856	8,371,648	1,706,374	1,412,842	5,252,432	982,208	55,618	11,042	915,548
30	Rhode Island	7	4,118,273	3,770,257	684,300	467,809	2,618,148	348,016	81,834	17,478	248,704
31	Tennessee	8	2,217,081	2,003,100	153,700	276,500	1,572,900	213,981	14,593	8,751	190,637
32	Texas	8	1,575,131	1,449,289	240,000	139,000	1,070,289	125,842	23,904	3,855	98,083
33	Vermont	8	390,116	367,512	22,100	56,000	289,412	22,604	9,044	926	12,634
34	Virginia	6	709,935	652,079	58,000	158,000	436,079	57,856	5,172	2,750	49,934
35	Washington	4	605,700	573,200	197,500	62,000	313,700	32,500	12,000	2,000	18,500
36	West Virginia	3	714,431	681,400	22,000	34,800	624,600	33,031	1,500	544	30,987
37	Wisconsin	18	2,900,609	2,756,381	400,600	286,560	2,069,281	144,228	56,707	21,819	65,702
38	All other states and territories (a)	19	7,289,161	6,500,227	976,000	1,134,120	4,390,107	788,934	85,384	4,349	699,201

a Includes states and territories having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arizona, 2; District of Columbia, 2; Mississippi, 2; Montana, 1; Nevada, 2; New Mexico, 2; North Dakota, 2; South Carolina, 2; South Dakota, 2; Utah, 1; Wyoming, 1.

BY STATES AND TERRITORIES: 1890.

MISCELLANEOUS EXPENSES.							AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES.						
							Aggregates.		Officers or firm members actively engaged in the industry or in supervision.				
									Males above 16 years.		Females above 15 years.		
Total.	Rent paid for tenancy.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.	Interest paid on cash used in the business.	All sundries not elsewhere reported.	Average number.	Total wages.	Number.	Wages.	Number.	Wages.	
$7,799,385	$630,711	$2,227,122	$77,293	$1,926,283	$1,561,773	$1,376,203	14,860	$10,642,794	1,026	$1,431,359	8	$3,764	1
16,050	1,660	5,361	631	3,580	3,433	1,385	75	49,423	8	13,300	.....	.....	2
26,766	375	3,547	400	2,310	12,861	7,273	47	36,486	8	11,580	.....	.....	3
334,491	88,692	79,311	817	86,085	60,052	19,534	988	769,177	50	61,907	.....	.....	4
22,927	2,220	9,117	320	3,500	1,575	6,195	111	114,549	7	26,100	.....	.....	5
113,648	20,432	31,746	4,001	22,343	6,452	28,674	303	223,127	27	39,782	.....	.....	6
24,342	175	2,571	28	3,333	81	18,154	62	46,044	5	6,200	1	400	7
15,510	300	3,151	242	4,715	2,619	4,483	36	24,174	7	7,067	.....	.....	8
114,975	24,520	22,807	1,544	13,263	13,424	39,417	156	95,337	18	24,975	.....	.....	9
1,313,365	14,760	137,596	9,254	128,544	1,015,820	7,391	1,463	960,385	54	113,012	1	400	10
110,120	22,035	37,297	407	18,602	10,549	21,230	334	201,635	43	48,203	1	260	11
79,389	2,495	19,361	1,310	5,882	21,447	28,894	140	83,598	22	19,620	.....	.....	12
20,415	1,197	9,126	638	3,716	2,917	2,821	73	55,101	14	10,946	1	1,800	13
29,085	564	6,214	25	3,464	6,360	12,458	77	47,217	19	13,350	.....	.....	14
132,460	444	102,024	420	19,311	9,061	1,200	95	66,963	11	22,576	.....	.....	15
50,574	1,856	15,092	486	10,138	3,226	19,776	76	52,710	16	16,021	.....	.....	16
103,267	4,225	97,526	8	385	.....	1,123	202	144,361	13	26,350	.....	.....	17
848,895	11,133	276,395	10,170	300,040	32,069	219,088	1,423	1,062,382	130	194,827	1	204	18
79,969	4,535	26,695	964	16,873	6,391	24,511	257	159,333	38	35,492	1	300	19
79,746	5,276	15,457	1,920	5,606	1,567	49,920	224	137,660	8	7,870	.....	.....	20
175,713	15,552	34,142	2,755	26,553	22,991	73,720	555	370,949	21	56,176	.....	.....	21
108,179	2,376	10,716	684	4,772	35,960	53,671	67	47,695	7	10,900	.....	.....	22
65,295	34,530	13,753	818	5,096	1,464	9,634	108	71,622	13	14,495	.....	.....	23
462,513	234,392	83,172	3,892	92,825	10,209	41,023	531	363,395	58	63,486	.....	.....	24
2,521,614	47,606	898,537	12,753	941,088	136,032	485,538	4,239	3,486,509	132	281,640	.....	.....	25
11,612	80	4,359	700	2,480	1,840	2,153	50	20,340	7	4,730	.....	.....	26
110,222	4,983	44,197	805	31,896	13,484	14,857	935	481,974	82	71,711	1	100	27
14,580	1,620	8,444	1,021	3,100	80	315	34	29,040	4	2,000	.....	.....	28
256,788	53,166	45,861	1,749	36,238	35,100	84,674	603	358,360	101	51,825	.....	.....	29
85,487	2,480	27,941	738	46,937	2,861	4,530	396	262,780	5	13,900	.....	.....	30
89,768	2,760	40,127	2,600	11,204	4,693	28,384	132	88,130	14	20,850	.....	.....	31
30,549	1,034	10,111	349	10,556	1,650	6,849	99	73,283	10	15,625	.....	.....	32
10,566	1,325	2,507	129	517	42	6,046	26	14,515	7	4,486	.....	.....	33
17,592	990	11,563	16	4,643	.....	380	52	36,071	16	17,213	.....	.....	34
14,852	750	1,322	1,505	.....	3,000	8,275	50	55,560	5	15,900	.....	.....	35
10,140	240	820	78	2,288	142	6,572	72	39,558	3	3,600	.....	.....	36
97,445	1,807	23,423	985	30,367	31,476	9,387	261	171,161	16	21,823	1	300	37
200,476	18,066	68,733	12,131	24,033	50,845	26,668	508	342,190	27	61,821	.....	.....	38

TABLE 1.—DETAILED STATEMENT, GAS MANUFACTURE,

	STATES AND TERRITORIES.	AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.									
		Clerks.				Operatives and skilled.				Unskilled.	
		Males above 16 years.		Females above 15 years.		Males above 16 years.		Children.		Males above 16 years.	
		Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.	Number.	Wages.
1	The United States	784	$689,137	46	$18,909	7,650	$5,558,130	21	$3,815	5,301	$2,934,517
2	Alabama	5	2,580			24	13,874			38	19,669
3	Arkansas	6	5,100			23	16,011			8	3,795
4	California	62	74,963	5	2,880	304	261,843			567	367,584
5	Colorado	8	9,810			29	26,636			67	51,973
6	Connecticut	12	10,124	6	3,200	79	68,530			179	101,491
7	Delaware	2	1,620			15	11,668			39	26,156
8	Florida	1	925			21	14,030			7	2,152
9	Georgia	17	8,785			39	21,931			82	39,643
10	Illinois	81	63,932	4	1,940	205	149,079			1,118	631,962
11	Indiana	9	7,470	2	690	112	69,361			167	75,651
12	Iowa	5	3,447	1	100	69	42,270	3	310	37	17,491
13	Kansas	5	2,782			42	33,713			11	5,860
14	Kentucky	5	3,200			40	26,388	2	145	11	4,134
15	Louisiana	13	15,940			45	19,537			26	8,910
16	Maine	6	4,300	1	480	30	17,903			23	14,006
17	Maryland	32	26,884			125	74,868			32	16,259
18	Massachusetts	136	91,801	7	2,199	818	573,540			331	199,811
19	Michigan	15	10,690	2	676	158	93,657			43	18,318
20	Minnesota	18	19,160			64	43,190			134	67,440
21	Missouri	25	23,334	3	1,680	419	239,734			87	50,025
22	Nebraska	5	3,762			25	16,860			30	16,173
23	New Hampshire	6	3,301			42	26,713			47	27,113
24	New Jersey	24	18,425			195	146,220			254	135,264
25	New York	133	141,318	4	910	3,231	2,668,144	2	360	719	391,787
26	North Carolina	2	700			31	11,910			10	3,000
27	Ohio	32	19,754	5	1,470	596	291,577			219	97,362
28	Oregon	3	2,500			27	24,540				
29	Pennsylvania	27	26,439	2	624	316	202,908			156	76,291
30	Rhode Island	20	18,730	2	1,040	34	34,247			335	194,863
31	Tennessee	12	10,704			36	26,172			70	30,404
32	Texas	16	10,740			50	32,610			23	14,308
33	Vermont					15	8,137			4	1,892
34	Virginia					36	18,858				
35	Washington	4	6,900			28	21,240			13	11,520
36	West Virginia	3	2,500			42	24,998	14	3,000	10	5,460
37	Wisconsin	11	9,340	1	360	129	87,837			101	51,321
38	All other states and territories	23	26,887	1	660	154	97,396			303	155,426

BY STATES AND TERRITORIES: 1890—Continued.

AVERAGE NUMBER OF EMPLOYÉS AND TOTAL WAGES—continued.						WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK.											
Unskilled—Continued.		Pieceworkers.				Males above 16 years.											
Children.		Males above 16 years.		Children.		Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	
Number.	Wages.	Number.	Wages.	Number.	Wages.													
17	$2,263	1	$150	6	$750	14,761	289	256	502	395	660	2,112	3,212	2,956	2,543	1,172	664	1
						75	3	6	12	7	2	18	3	3	12	2	7	2
						47		2		2	2	4	15	9	4	5	4	3
						983	4	7	1	31	2	6	33	566	151	85	97	4
						111							12	40	41	7	11	5
						297	1	2		2	27	53	57	83	26	30	16	6
						61		1				16	4	7	29	1	3	7
						36		6	1	2	2	4	7	2	6	3	3	8
						156	6	6	17	14	16	17	29	25	11	6	9	9
						1,458	10	9	4	8	27	407	643	73	193	35	49	10
						331	48	8	6	8	40	26	59	90	21	8	17	11
3	360					133	7		4	9	17	22	24	24	15	6	5	12
						72		4	1	2	4	13	6	17	18	3	4	13
						75	9	9	2	8	4	3	11	9	8	5	7	14
						95	1	19		36	2		3	9	14	1	10	15
						75	3	1	1	4		17	6	26	8	2	7	16
						202	4	4	2	32		60	5	67	24	1	3	17
						1,415	25	21	24	24	49	77	281	336	468	48	62	18
						254	11	14	8	19	16	42	52	43	24	14	11	19
						224		1	3	2	16	71	49	53	20	1	8	20
						552	7	5	3	9	19	33	363	54	41	6	12	21
						67	2	1	2		5	16	12	12	10	1	6	22
						108	2	2	3	1	7	21	31	25	7	6	3	23
						531	13	7	2	11	21	86	163	105	50	49	24	24
11	1,450	1	150	6	750	4,215	23	15	54	22	86	739	754	771	921	693	137	25
						50	8	15	4	9		2	1	6	4		1	26
						929	25	68	221	43	48	168	104	112	93	15	32	27
						34			2		2	2	1	3	22	1	1	28
1	273					600	58	14	34	45	44	81	71	122	91	14	26	29
						394		2		1	25	3	252	55	42	4	10	30
						132	2	3	14	30	7	11	27	11	6	6	15	31
						99			3	2	3	9	14	35	24	2	7	32
						26	3	2	1		5		7	2	2	4		33
						52	2		1	6	4	11	3	8	10	3	4	34
						50							2	19	20	2	7	35
						58	1					1	16	35	2	1	2	36
2	180					257	2	2	2	2	3	61	70	38	64	4	9	37
						507	9		70	4	155	12	22	61	41	98	35	38

TABLE 1.—DETAILED STATEMENT, GAS MANUFACTURE,

	STATES AND TERRITORIES.	WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF EMPLOYÉS AT EACH RATE, INCLUDING OFFICERS, FIRM MEMBERS, AND CLERKS, BUT NOT THOSE EMPLOYED ON PIECEWORK—continued.															
		Females above 15 years.												Children.			
		Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over but under $8.	$8 and over but under $9.	$9 and over but under $10.	$10 and over but under $12.	$12 and over but under $15.	$15 and over but under $20.	$20 and over but under $25.	$25 and over.	Total number.	Under $5.	$5 and over but under $6.	$6 and over but under $7.	$7 and over.
1	The United States	54	10	7	9	6	6	2	8	2	3		1	38	37	1		
2	Alabama																	
3	Arkansas																	
4	California	5						1	4									
5	Colorado																	
6	Connecticut	6					3		2		1							
7	Delaware	1				1												
8	Florida																	
9	Georgia																	
10	Illinois	5	1	1		1			1		1							
11	Indiana	3		2		1												
12	Iowa	1	1											6	6			
13	Kansas	1											1					
14	Kentucky													2	2			
15	Louisiana																	
16	Maine	1						1										
17	Maryland																	
18	Massachusetts	8	3	1	1	2	1											
19	Michigan	3		1	2													
20	Minnesota																	
21	Missouri	3			1				1		1							
22	Nebraska																	
23	New Hampshire																	
24	New Jersey																	
25	New York	4	2		2									13	13			
26	North Carolina																	
27	Ohio	6	3		2		1											
28	Oregon																	
29	Pennsylvania	2		1		1								1		1		
30	Rhode Island	2					1			1								
31	Tennessee																	
32	Texas																	
33	Vermont																	
34	Virginia																	
35	Washington																	
36	West Virginia													14	14			
37	Wisconsin	2		1	1									2	2			
38	All other states and territories	1								1								

BY STATES AND TERRITORIES: 1890—Continued.

Aggregate cost.	MATERIALS USED.														
	Coking coal.		Cannel coal.		Anthracite coal (in water gas generators).		Slack.		Bituminous coal (in water gas generators).		Coke (in water gas generators not made at works).		Crude oil.		
	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Tons.	Cost.	Bushels.	Cost.	Barrels.	Cost.	
$14,037,087	1,911,661	$7,022,812	56,715	$359,226	313,170	$1,338,303	14,650	$24,568	14,359	$52,942	1,922,733	$190,342	740,207	$882,812	1
36,928	11,973	29,102	630	3,900											2
30,890	13,520	16,659	50	350			1,240	1,940			13,310	2,659	1,585	2,155	3
1,175,135	93,617	751,016	2,032	26,654	7,098	72,817	522	1,540	51	506	36,130	10,066	83,517	243,260	4
113,022	31,107	105,008					54	54					365	913	5
276,862	46,064	187,975	342	3,418	3,926	20,625	12	30			8,000	560	14,248	16,466	6
49,122	10,730	38,690			784	3,069									7
25,880	914	4,272			552	2,876	11	22	766	3,361			3,809	9,537	8
135,698	27,861	95,176	135	675	1,431	7,691					61,480	3,076	9,069	17,326	9
829,995	42,633	131,759	2,147	8,050	44,587	201,324	1,714	2,081			1,025,280	107,523	330,436	257,878	10
170,023	41,742	114,599	1,730	5,539	883	4,716	835	985			53,850	4,786	4,523	8,710	11
104,265	14,199	66,062	992	4,968	544	3,679	70	81	100	250	30,525	3,397	6,131	7,175	12
52,010	10,278	31,776			339	3,058	570	1,176	205	449	13,548	1,729	2,158	8,741	13
48,137	9,597	23,882	15	72	1,206	4,643	210	287					3,600	7,200	14
112,965	6,058	23,917	6	40	1,501	10,000					87,000	8,700			15
68,999	11,464	51,736	35	525	728	4,929			48	250			2,674	3,854	16
445,584	2,284	6,869	3,910	15,265	25,182	99,491					18,400	1,640			17
1,747,013	307,115	1,257,545	4,308	33,926	2,347	24,805	25	108	1,000	4,000			15,242	22,196	18
181,958	42,083	129,573	1,319	5,959	4,443	15,948	182	568			18,956	1,549	6,845	5,985	19
180,912	12,236	54,742	116	775	4,020	23,761	1,736	5,158					35,886	40,297	20
458,830	108,584	362,767	310	1,403	328	2,943	900	540					22,080	24,354	21
106,387	1,896	10,675	20	235	3,414	18,470	1,473	3,265			185,780	18,578	19,090	23,576	22
101,835	14,523	77,181	131	1,312	756	3,963			100	525			5,659	6,615	23
428,612	40,557	174,295	7,391	35,701	13,396	52,897	48	48	8,500	34,000	18,725	1,311	44,882	48,602	24
4,944,042	559,722	1,850,813	20,638	141,311	169,921	650,929	137	145			11,030	1,112	55,781	50,828	25
27,972	3,900	15,980			500	3,200							1,800	3,050	26
494,558	144,858	376,441	2,619	9,523	375	1,950	2,659	3,709	313	534	37,870	4,551	23,266	17,239	27
69,035	8,881	58,170	452	8,888									200	400	28
389,798	68,430	157,973	552	2,855	8,765	26,094	2,072	2,570	3,227	8,788	204,996	11,228	21,254	24,675	29
252,708	50,026	186,763	3,225	21,609	1,723	8,223					70,476	4,229	12,035	13,975	30
124,442	27,584	77,226	161	1,285							9,061	906	1,400	2,575	31
92,793	16,705	85,808	20	180									989	2,031	32
14,223					837	4,502			49	279	6,000	1,050	2,048	2,467	33
44,384	7,186	24,249	26	171	938	3,977									34
53,041	9,033	43,635	1,493	8,457											35
30,859	16,560	26,427			65	390									36
192,114	40,479	130,362	1,119	5,679	2,391	12,397	180	261			5,040	540	3,176	4,510	37
426,056	57,262	243,689	791	10,501	10,190	44,936					7,276	1,152	5,849	11,192	38

TABLE 1.—DETAILED STATEMENT, GAS MANUFACTURE,

	STATES AND TERRITORIES.	MATERIALS USED—continued.										Fuel.	
		Prepared or gas oil.		Naphtha.		Natural gas.		Oxide of iron.		Lime.		Total cost.	Wood.
		Barrels.	Cost.	Gallons.	Cost.	Feet.	Cost.	Bushels.	Cost.	Bushels.	Cost.		Cost.
1	The United States	126,839	$212,728	51,909,055	$2,387,465	153,992,364	$19,389	239,727	$51,936	4,596,612	$426,590	$524,249	$25,233
2	Alabama									13,005	2,411	1,450	
3	Arkansas	36	126					150	150	7,905	1,464	5,087	4,555
4	California	1,000	3,250	27,500	2,450			1,458	1,417	107,110	37,217	11,879	8,203
5	Colorado	236	1,357							15,324	3,208	1,328	258
6	Connecticut	1,988	6,541	402,726	19,703					94,953	13,133	8,218	
7	Delaware			148,571	5,992			700	70	1,300	200		
8	Florida	911	2,468					364	101	9,798	652	2,079	1,489
9	Georgia			77,748	5,286			3,958	1,031	15,604	1,776	2,234	
10	Illinois	300	300	1,504,778	45,264			38,222	9,034	41,458	8,878	56,927	
11	Indiana	464	1,356	210,602	10,208	15,900,000	825	2,135	641	23,575	3,885	13,289	450
12	Iowa			141,126	7,116			5,813	354	15,582	2,404	3,132	24
13	Kansas			62,191	3,659					26,271	4,590	996	
14	Kentucky	365	912	96,652	5,479			700	350	5,852	1,267	3,913	
15	Louisiana			1,000,000	67,500					21,258	1,328	1,100	
16	Maine	400	1,195	29,272	1,830			4,610	464	10,564	3,054	1,106	
17	Maryland			6,149,642	263,924			3,918	1,393	459,440	11,338	28,583	67
18	Massachusetts	2,882	6,801	932,218	77,415			18,120	2,865	168,611	26,196	11,071	933
19	Michigan			165,155	7,103			3,782	541	21,497	3,087	7,859	800
20	Minnesota			300,200	17,302			150	90	32,043	7,516	8,815	1,376
21	Missouri			480,388	25,885			13,148	2,716	221,762	24,199	11,416	165
22	Nebraska	1,200	4,200	167,110	11,865			4,305	2,483	57,634	3,077	7,258	
23	New Hampshire	462	785	46,989	3,144			100	25	19,300	2,776	5,359	1,003
24	New Jersey	2	10	921,034	42,110			74,314	3,245	183,733	15,426	17,051	30
25	New York	101,876	166,551	33,203,211	1,508,719	3,732,572	4,998	38,243	15,682	2,428,881	188,599	249,170	1,293
26	North Carolina			46,500	2,613					1,660	453	1,666	1,666
27	Ohio	820	935	120,626	3,886	21,572,092	2,243	7,820	3,125	73,799	8,159	6,092	24
28	Oregon							280	564	3,000	693		
29	Pennsylvania	9,927	12,188	2,196,545	89,827	112,787,700	11,323	710	323	112,876	15,168	21,562	26
30	Rhode Island	95	140					5,750	575	85,448	11,293	3,389	
31	Tennessee			377,934	20,820			2,440	1,701	14,930	2,286	16,672	
32	Texas			1,277	127					13,903	2,700	547	547
33	Vermont	455	1,243	62,492	2,565					5,525	672	1,499	390
34	Virginia			241,250	13,269			25	20	10,325	1,133	1,440	
35	Washington							320	124	1,086	550	100	100
36	West Virginia			16,500	660					10,940	1,547	1,835	
37	Wisconsin			701,171	29,914			5,723	1,285	5,194	1,006	5,981	1,490
38	All other states and territories	420	2,170	2,047,647	91,884			2,409	1,567	255,456	13,649	4,146	344

BY STATES AND TERRITORIES: 1890—Continued.

MATERIALS USED—continued.					PRODUCTS.							
Fuel—Continued.						Gas manufactured.						
Anthracite coal.	Bituminous coal.	Coke not made at works.	Natural gas.	All other materials.	Total value.	Total.		Coal.		Water.		
Cost.	Cost.	Cost.	Cost.	Cost.		Cubic feet.	Value.	Cubic feet.	Value.	Cubic feet.	Value.	
$163,772	$100,515	$216,240	$18,489	$543,725	$56,987,290	36,519,511,510	$51,866,831	19,091,449,238	$28,325,745	16,289,044,897	$21,686,732	1
.....	1,210	240	.....	65	206,623	101,401,500	178,036	101,401,500	178,036	.....	.....	2
.....	532	.....	.....	300	153,546	57,608,600	144,221	30,974,200	79,035	18,738,800	45,347	3
780	1,125	1,771	.....	13,033	3,681,705	1,518,768,849	3,331,337	1,050,311,465	2,350,148	450,356,000	925,093	4
470	.....	600	.....	1,154	561,067	299,314,500	487,259	297,694,500	481,160	.....	.....	5
4,036	2,905	1,277	.....	187	1,200,575	640,032,021	1,046,408	411,515,502	662,488	221,761,519	368,785	6
.....	.....	.....	.....	1,101	191,451	134,624,150	169,766	99,205,150	126,555	35,419,000	43,211	7
590	.....	.....	.....	312	115,949	46,545,000	114,441	9,886,000	18,825	33,277,000	77,186	8
1,357	160	717	.....	1,427	526,770	322,529,767	445,903	211,287,567	290,730	110,742,200	152,673	9
2,885	38,461	15,581	.....	977	5,204,206	3,906,863,870	5,058,681	403,678,870	662,396	3,499,885,000	4,389,135	10
.....	2,598	.....	10,241	484	873,750	524,884,310	738,772	393,278,310	571,808	122,676,000	146,054	11
1,786	1,068	254	.....	5,647	392,090	183,218,600	349,676	120,019,600	217,621	55,299,000	110,755	12
.....	766	5	225	836	232,665	111,924,985	195,537	87,113,065	146,767	16,241,000	32,506	13
.....	533	3,380	.....	132	226,588	117,452,400	204,531	89,626,200	134,521	23,856,000	50,900	14
1,100	.....	.....	.....	380	685,976	207,998,900	665,631	57,998,900	166,131	96,000,000	319,680	15
829	277	.....	.....	56	311,381	137,065,200	267,883	112,110,300	217,423	23,459,900	46,668	16
1,939	16,092	10,485	.....	17,081	1,776,867	1,401,959,800	1,770,062	18,596,200	32,442	1,383,363,600	1,737,620	17
3,343	3,633	3,162	.....	280,085	6,203,125	3,601,595,243	5,230,787	3,368,335,071	4,923,909	223,401,788	275,413	18
1,501	483	5,075	.....	3,786	898,418	495,969,010	741,702	435,272,010	639,076	42,164,000	67,917	19
.....	3,839	3,600	.....	22,456	846,103	458,899,000	772,414	117,737,000	199,178	325,604,000	547,306	20
8,000	3,251	.....	.....	2,607	2,007,833	1,273,522,140	1,722,326	1,079,300,140	1,573,355	193,299,000	142,966	21
.....	7,258	.....	.....	2,705	394,365	222,537,790	385,054	10,083,790	22,906	192,994,000	327,058	22
2,640	1,716	.....	.....	150	358,678	193,576,579	318,010	149,208,000	234,710	26,649,180	42,219	23
8,436	425	8,160	.....	3,916	2,030,226	1,137,957,197	1,914,646	525,932,129	843,288	579,733,268	1,006,775	24
107,388	2,669	137,570	250	115,185	18,716,683	13,208,942,480	17,378,448	5,619,222,290	7,800,656	6,976,301,390	8,638,709	25
.....	.....	.....	.....	1,010	83,366	40,267,125	82,376	27,500,000	55,000	10,890,000	21,380	26
48	1,383	3,321	1,316	56,171	2,032,050	1,553,092,866	1,799,352	1,351,084,244	1,535,485	195,023,022	247,796	27
.....	.....	.....	.....	320	239,458	85,895,000	209,123	85,895,000	209,123	.....	.....	28
12,949	2,999	931	4,657	5,224	1,955,893	1,531,430,048	1,831,894	637,446,859	785,595	692,449,130	944,575	29
.....	.....	3,389	.....	2,512	812,013	645,671,600	685,612	534,824,000	568,084	110,847,600	117,528	30
.....	100	16,572	.....	971	532,462	285,299,900	462,728	229,299,900	361,978	.....	.....	31
.....	.....	.....	.....	1,800	387,729	147,193,176	346,197	145,003,176	340,722	.....	.....	32
1,109	.....	.....	.....	6	81,050	36,367,704	81,032	.....	.....	26,580,600	56,478	33
.....	1,440	.....	.....	125	192,984	103,130,200	173,311	62,565,500	116,521	40,564,700	56,790	34
.....	.....	.....	.....	175	213,473	81,461,500	190,790	81,446,500	190,734	.....	.....	35
.....	35	.....	1,800	.....	144,971	141,419,900	124,750	139,769,900	121,370	1,650,000	3,380	36
1,646	2,845	.....	.....	179	819,596	558,042,200	704,144	407,904,400	503,896	146,555,800	189,625	37
940	2,712	150	.....	1,170	1,695,005	1,005,048,400	1,517,991	588,922,000	904,073	413,262,400	555,204	38

TABLE 1.—DETAILED STATEMENT, GAS MANUFACTURE,

	STATES AND TERRITORIES.	PRODUCTS—continued.							
		Gas manufactured—Continued.						By-products.	
		Oil.		Wood.		Fuel (noncarbureted).		Coke.	
		Cubic feet.	Value.	Cubic feet.	Value.	Cubic feet.	Value.	Bushels.	Value.
1	The United States	962,585,650	$1,782,803	13,527,725	$46,391	162,904,000	$25,160	56,624,344	$3,868,924
2	Alabama							344,620	22,467
3	Arkansas			7,895,600	19,839			80,675	6,040
4	California	14,361,384	35,596	3,740,000	20,500			1,334,820	300,566
5	Colorado	1,620,000	6,099					484,312	48,665
6	Connecticut	6,755,000	15,135					1,322,527	113,487
7	Delaware							328,000	17,240
8	Florida	3,382,000	18,430					12,332	1,233
9	Georgia	500,000	2,500					656,536	58,713
10	Illinois	3,300,000	7,150					1,187,465	79,858
11	Indiana	8,930,000	20,910					1,321,825	89,007
12	Iowa	7,900,000	21,300					419,555	32,362
13	Kansas	8,570,920	16,264					290,800	29,961
14	Kentucky	3,970,200	19,110					240,576	14,019
15	Louisiana	54,000,000	179,820					181,394	17,689
16	Maine	1,265,000	3,332			230,000	460	388,506	33,520
17	Maryland							95,491	4,645
18	Massachusetts	9,858,384	37,465					10,285,234	779,657
19	Michigan	18,533,000	34,709					1,326,537	112,961
20	Minnesota	15,558,000	25,930					363,994	47,055
21	Missouri	923,000	6,005					2,740,551	163,332
22	Nebraska	19,460,000	35,090					34,500	5,560
23	New Hampshire	17,719,399	41,081					332,881	32,379
24	New Jersey	32,291,800	64,583					1,438,418	85,435
25	New York	613,418,800	939,083					19,112,105	1,058,266
26	North Carolina			1,877,125	5,996			3,600	360
27	Ohio	5,311,600	15,521			1,674,000	550	3,302,502	159,982
28	Oregon							295,857	23,493
29	Pennsylvania	40,534,059	77,574			161,000,000	24,150	2,042,780	88,406
30	Rhode Island							1,857,745	96,382
31	Tennessee	56,000,000	100,750					815,902	59,152
32	Texas	2,190,000	5,475					375,628	30,236
33	Vermont	9,787,104	24,554						
34	Virginia							151,150	15,423
35	Washington			15,000	56			179,570	16,829
36	West Virginia							325,088	9,195
37	Wisconsin	3,582,000	10,623					961,321	93,952
38	All other states and territories	2,864,000	18,714					1,989,547	124,367

BY STATES AND TERRITORIES: 1890—Continued.

PRODUCTS—continued.				Net value of products.	PRODUCTS (INCLUDED IN PRECEDING COLUMNS) CONSUMED AT OFFICES OR WORKS AND UNACCOUNTED FOR.						
By-products—Continued.					Total value.	Gas used at office or works.		Gas made and unaccounted for.		By-products used at works.	
Tar.		Ammoniacal liquor.									
Gallons.	Value.	Gallons.	Value.			Cubic feet.	Value.	Cubic feet.	Value.	Value.	
24,401,856	$992,565	38,180,930	$258,970	$49,667,964	$7,319,326	309,471,410	$450,221	3,685,340,245	$5,179,323	$1,689,782	1
143,264	6,120	.....	.....	171,958	34,665	3,608,200	8,424	11,333,340	13,611	12,630	2
35,624	3,285	.....	.....	132,667	20,879	1,070,000	2,700	5,275,600	13,280	4,899	3
673,734	49,802	.....	.....	3,281,570	400,135	7,569,783	20,120	140,590,647	308,211	71,804	4
338,596	25,743	.....	.....	453,515	108,152	4,821,800	7,813	55,467,700	90,733	9,606	5
618,310	32,416	389,780	8,264	1,068,248	132,327	11,335,654	16,722	47,992,885	78,282	37,323	6
122,850	3,879	51,752	566	172,890	18,561	331,250	490	8,241,800	10,897	7,174	7
6,700	275	.....	.....	108,160	7,789	350,000	695	2,495,890	6,083	1,011	8
271,130	13,524	430,000	8,600	441,517	85,253	1,939,467	3,205	44,475,500	54,847	27,201	9
2,327,511	62,167	650,000	8,500	4,988,310	215,896	4,936,200	10,246	122,921,440	174,610	31,040	10
1,253,302	40,971	125,000	5,000	755,890	117,860	7,496,500	10,942	56,626,710	78,105	28,813	11
166,298	10,052	.....	.....	338,212	53,878	1,774,600	3,201	19,920,300	35,018	15,659	12
89,693	7,167	.....	.....	185,551	47,114	1,720,400	2,832	14,832,285	24,817	19,465	13
123,146	8,038	.....	.....	195,404	31,184	2,343,700	3,706	10,650,539	18,361	9,117	14
65,100	2,656	.....	.....	658,788	27,188	2,821,800	8,988	4,960,570	14,654	3,516	15
190,256	9,978	.....	.....	256,576	54,805	2,080,740	4,471	17,082,900	36,103	14,231	16
69,192	2,160	.....	.....	1,467,074	309,793	8,425,080	10,907	235,856,600	296,958	1,928	17
4,032,818	146,322	4,019,560	40,359	5,292,483	910,642	45,203,828	62,509	288,037,925	413,780	434,353	18
334,470	39,098	15,082,632	4,657	753,092	145,326	5,953,167	10,849	44,119,443	71,045	63,432	19
368,160	26,634	.....	.....	753,657	92,446	4,940,000	9,552	37,949,190	64,759	18,135	20
1,438,071	78,504	3,657,758	43,671	1,716,677	291,156	7,563,785	10,073	209,727,861	257,851	24,232	21
75,990	3,751	.....	.....	360,460	33,905	1,446,700	2,781	17,254,490	27,428	3,696	22
182,468	8,289	.....	.....	311,497	47,181	2,384,700	4,443	13,792,278	22,574	20,164	23
650,085	24,608	130,900	5,537	1,777,854	252,372	4,861,505	9,541	127,406,667	214,611	28,220	24
6,008,015	177,228	9,721,131	102,741	15,949,259	2,767,424	97,021,430	133,456	1,608,713,625	2,123,843	510,125	25
12,400	630	.....	.....	76,963	6,403	510,000	1,020	2,582,300	5,383	.....	26
1,154,143	62,167	718,659	10,540	1,765,418	266,632	14,623,900	17,331	151,889,660	168,568	80,733	27
68,420	6,842	.....	.....	215,416	24,042	201,200	822	7,550,000	20,062	3,158	28
824,106	28,455	807,110	7,138	1,763,662	192,231	13,120,208	17,369	100,540,910	131,912	42,950	29
748,821	20,976	1,710,400	9,043	675,289	136,724	11,024,600	15,357	54,830,900	73,684	47,683	30
279,208	10,582	.....	.....	472,426	60,036	4,109,900	5,188	34,053,750	36,989	17,859	31
175,261	10,096	15,000	600	330,497	57,232	1,516,900	3,850	21,394,862	47,401	5,981	32
720	18	.....	.....	72,402	8,648	1,000,504	3,465	2,353,600	5,183	.....	33
79,658	4,250	.....	.....	163,764	29,220	408,500	765	11,402,300	19,655	8,800	34
63,364	5,854	.....	.....	181,891	31,582	1,343,500	3,334	8,775,820	19,984	8,264	35
221,350	9,445	303,200	1,581	118,843	26,128	22,900,980	11,803	16,800,320	13,650	675	36
376,829	22,413	83,480	2,087	707,914	111,682	1,583,120	2,774	70,021,470	76,944	31,964	37
612,774	27,570	284,568	5,077	1,532,170	162,865	4,974,749	8,477	66,418,168	109,447	44,911	38

TABLE 2.—CAPITAL STOCK, IMPROVEMENTS, CHARACTERISTICS OF MACHINERY AND PLANT, GAS SOLD,

	STATES AND TERRITORIES.	Number of establishments reporting.	CAPITAL STOCK.								Total value of all improvements during the year.
			Total value.	Number of shares.							
				Total.	Issued.	Owned by—					
						Males.	Females.	Residents of state.	Nonresidents of state.	Residents of foreign countries.	
1	The United States	742	$229,746,552	4,083,481	2,328,852	1,865,048	463,804	1,644,390	659,303	25,159	$3,360,977
2	Alabama	7	1,117,300	11,173	11,148	8,558	2,500	5,987	5,161	.....	35,250
3	Arkansas	7	518,850	20,754	20,754	20,404	350	16,683	4,071	.....	45,000
4	California	44	18,312,000	292,200	193,937	159,766	34,171	173,136	10,619	19,182	128,326
5	Colorado	6	1,580,000	13,100	6,100	5,098	2	3,891	1,209	.....	3,400
6	Connecticut	20	3,807,500	145,700	105,700	73,642	32,058	83,890	20,970	840	56,267
7	Delaware	4	510,370	13,845	13,845	10,086	3,759	9,820	4,025	.....	1,565
8	Florida	7	586,000	5,460	5,230	4,967	263	1,278	3,927	25	16,095
9	Georgia	11	1,532,400	46,566	46,048	44,026	2,020	9,369	36,050	629	131,409
10	Illinois	36	34,913,550	744,775	35,265	28,963	6,302	27,827	7,113	325	85,974
11	Indiana	33	2,665,775	61,785	60,407	48,891	11,516	49,033	10,074	1,300	15,939
12	Iowa	19	1,859,500	23,567	23,317	20,408	2,909	11,125	12,192	.....	69,812
13	Kansas	12	1,160,000	11,160	11,160	10,520	640	5,895	5,265	.....	3,207
14	Kentucky	14	975,700	16,807	16,657	13,754	2,903	11,953	4,686	18	7,035
15	Louisiana	4	4,320,000	45,300	5,000	4,950	50	4,510	490	.....	9,000
16	Maine	11	1,012,500	13,825	11,856	9,494	2,362	9,858	1,982	16	6,600
17	Maryland	7	11,341,500	120,225	117,826	94,331	23,495	85,401	32,425	.....	.....
18	Massachusetts	72	13,008,400	125,798	118,410	94,593	23,817	87,002	31,353	55	169,203
19	Michigan	27	3,010,900	59,318	51,556	39,872	11,684	34,320	16,417	819	33,347
20	Minnesota	10	3,710,000	67,200	63,200	53,652	9,548	22,728	40,422	50	194,258
21	Missouri	17	11,658,000	117,480	117,480	105,143	12,337	34,023	78,648	4,809	396,373
22	Nebraska	9	1,095,000	61,050	58,600	58,600	.....	51,766	6,834	.....	48,724
23	New Hampshire	13	914,600	14,166	13,617	11,036	2,581	10,300	3,293	24	8,074
24	New Jersey	33	5,489,370	189,529	157,421	118,785	38,636	106,517	47,816	3,088	83,199
25	New York	94	68,699,402	870,530	321,265	257,935	63,330	267,088	53,418	759	1,063,020
26	North Carolina	6	356,000	5,700	4,691	3,985	706	1,372	3,137	182	500
27	Ohio	61	8,462,550	448,263	175,233	141,262	33,971	88,244	86,989	.....	74,560
28	Oregon	4	1,175,000	12,250	11,250	10,410	840	7,700	3,550	.....	1,000
29	Pennsylvania	73	8,099,585	242,986	230,666	172,187	58,479	207,044	23,622	.....	51,834
30	Rhode Island	7	3,452,500	64,150	60,450	42,348	18,102	55,365	5,085	.....	123,900
31	Tennessee	8	1,884,400	30,478	30,478	26,302	4,176	18,622	11,632	224	176,730
32	Texas	8	1,800,000	13,000	13,000	12,610	390	8,860	3,890	250	2,800
33	Vermont	8	305,850	10,445	10,445	8,668	1,777	7,536	2,909	.....	1,758
34	Virginia	6	479,250	10,920	10,920	6,804	4,116	8,920	2,000	.....	300
35	Washington	4	1,410,000	17,200	4,700	4,250	450	3,650	1,050	.....	14,500
36	West Virginia	3	687,875	1,070	1,070	823	247	892	178	.....	6,000
37	Wisconsin	18	2,874,825	43,603	42,583	35,150	7,433	21,968	21,549	66	46,609
38	All other states and territories (a)	19	4,960,100	182,105	148,567	102,773	45,794	90,817	56,252	1,496	249,409

a Includes states and territories having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arizona, 2; District of Columbia, 2; Mississippi, 2; Montana, 1; Nevada, 2; New Mexico, 2; North Dakota, 2; South Carolina, 2; South Dakota, 2; Utah, 1; Wyoming, 1.

NUMBER OF CONSUMERS, AND CITY CONSUMPTION, GAS MANUFACTURE, BY STATES AND TERRITORIES: 1890.

NUMBER OF PHOTOMETERS USED.		GAS HOLDERS.		STATION METERS IN USE.		REGENERATIVE LAMPS.	BURNERS USED IN INCANDESCENT GAS LIGHTING.	STEAM POWER.			
At works.	At offices.	Number.	Capacity. (Cubic feet.)	Number.	Capacity. (Cubic feet.)	Number.	Number.	Number of boilers.	Number of engines.	Horse power.	
561	212	1,396	168,937,789	601	242,730,900	7,544	2,754	992	981	26,390	1
4	2	11	493,000	7	1,770,000	14	.....	6	6	34	2
4	1	9	341,096	6	770,000	25	.....	6	7	62	3
25	11	78	5,156,500	21	12,352,200	58	300	33	24	1,132	4
3	2	12	1,048,000	6	1,670,000	158	.....	7	6	92	5
13	6	34	2,339,000	16	3,646,000	105	.....	26	24	628	6
1	1	9	741,000	4	1,355,000	21	.....	3	5	40	7
6	1	10	311,000	4	1,189,000	57	.....	10	9	183	8
8	5	21	1,639,500	10	3,128,000	13	.....	16	15	467	9
33	12	69	16,342,000	41	20,918,800	137	.....	66	50	3,058	10
23	9	48	2,589,000	23	4,490,000	137	.....	28	32	458	11
10	4	29	827,000	13	2,269,000	85	.....	19	21	761	12
10	1	13	556,000	7	805,000	81	.....	12	13	430	13
4	1	18	459,000	11	1,575,000	8	.....	11	11	268	14
5	1	10	1,401,500	6	1,860,000	.....	.....	10	6	207	15
11	1	19	830,000	9	1,176,000	66	6	13	11	181	16
8	1	24	5,543,716	13	9,262,000	11	.....	18	12	128	17
77	42	161	23,307,213	63	24,441,000	2,169	565	98	97	2,477	18
19	6	39	2,684,000	18	2,915,000	542	.....	24	29	355	19
8	.....	17	2,889,496	7	2,290,000	269	.....	13	14	737	20
9	5	31	7,207,000	17	9,515,000	138	.....	30	26	610	21
5	1	14	1,403,000	4	1,215,000	50	.....	5	5	465	22
16	4	33	1,256,000	9	2,150,000	155	100	10	10	192	23
32	8	60	5,705,800	32	7,906,800	377	65	51	47	777	24
80	27	250	54,700,090	94	76,707,500	494	435	217	216	7,269	25
3	.....	11	290,000	2	175,000	20	.....	4	4	88	26
34	21	89	5,193,200	43	8,719,000	867	580	64	74	1,241	27
2	.....	5	470,800	1	500,000	22	.....	1	1	10	28
41	13	118	6,807,573	43	11,838,000	246	10	87	85	1,332	29
15	3	26	3,886,000	10	5,015,000	183	.....	12	12	302	30
3	3	16	1,862,000	5	3,770,000	23	.....	10	11	260	31
5	4	11	786,000	7	1,305,000	155	540	9	9	68	32
6	1	15	177,500	.....	.....	3	10	6	9	182	33
5	3	11	704,549	7	850,000	70	.....	4	4	35	34
3	1	6	343,000	3	580,000	12	.....	6	6	195	35
2	1	6	841,300	1	900,000	.....	.....	4	5	49	36
14	4	29	2,692,865	16	3,395,000	90	108	17	21	472	37
14	6	34	5,113,100	22	10,316,000	683	35	36	35	1,145	38

TABLE 2.—CAPITAL STOCK, IMPROVEMENTS, CHARACTERISTICS OF MACHINERY AND PLANT, GAS SOLD, NUMBER

	STATES AND TERRITORIES.	GAS MAKING PLANT.										
		Coal gas benches.										
		1's	2's	3's	4's	5's	6's	7's	8's	9's	Regenerative.	Total daily capacity of plant. (Cubic feet.)
		Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	
1	The United States	26	79	717	32	691	1,373	32	1	90	272	133,710,444
2	Alabama		2	2		16	12					60,000
3	Arkansas			4		6	3					540,000
4	California	5	9	38	2	58	86				20	3,618,000
5	Colorado			26		8						24,000
6	Connecticut			9		1	35				21	1,841,000
7	Delaware		2	3		16	6					300,000
8	Florida			4			2					608,000
9	Georgia		4	19		7	25				1	1,120,000
10	Illinois			56	1	16	31				3	16,865,000
11	Indiana		3	21		29	55				3	1,165,000
12	Iowa	3	3	17		8	20	1				1,308,700
13	Kansas		1	11	4	1	3					370,000
14	Kentucky			12		10	10					363,000
15	Louisiana			5		2	7					1,024,000
16	Maine	1	1	12		26	1				9	410,000
17	Maryland		3	8								13,950,000
18	Massachusetts	5	13	38	4	67	363			6	9	6,670,500
19	Michigan		2	24	1	25	45				1	1,125,000
20	Minnesota			4	3	1				8	4	3,473,000
21	Missouri			108		32	32	9	1	8	17	2,045,000
22	Nebraska			2		2	2					1,635,000
23	New Hampshire		5	4		7	17					832,000
24	New Jersey	2	2	33	5	57	34			6	21	5,650,000
25	New York	2	10	91	4	104	235	20		24	84	49,770,000
26	North Carolina	3	1			3						125,000
27	Ohio		2	53	7	58	67			3	26	2,372,500
28	Oregon			6			17					600,000
29	Pennsylvania		11	29		62	81				13	7,240,244
30	Rhode Island		1	3	1	2	71				12	1,130,000
31	Tennessee	3		5		3	41					856,500
32	Texas			17		3	5			3		190,000
33	Vermont		2									417,000
34	Virginia			11		14						300,000
35	Washington		1			15	1					
36	West Virginia			2		1	22					20,000
37	Wisconsin		1	19		15				22	22	1,306,000
38	All other states and territories	2		21		16	44	2		10	6	4,386,000

OF CONSUMERS, AND CITY CONSUMPTION, GAS MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

GAS MAKING PLANT—continued.					STREET MAINS.							
Generators.				Retorts, oil.	Total length.		Diameter (inches).					
Water gas.		Fuel gas.					1	1¼	1½	2	2½	
Number.	Capacity per 24 hours. (Cubic feet.)	Number.	Capacity per 24 hours. (Cubic feet.)	Capacity per 24 hours. (Cubic feet.)	Miles.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	
507	115,436,200	18	1,844,000	16,430,244	12,065	1,776	707,209	515,471	740,010	4,759,967	620,155	1
1	60,000	.....	.....	.....	61	1,564	4,000	7,760	10,760	67,700	7,920	2
5	540,000	.....	.....	.....	44	3	6,042	10,637	3,040	16,355	.....	3
10	3,560,000	.....	.....	58,000	519	4,402	25,670	9,907	35,617	392,156	30,620	4
.....	.....	.....	.....	24,000	80	4,694	120	.....	8,400	56,754	10,560	5
20	1,636,000	3	145,000	60,000	302	3,540	2,151	1,260	8,184	116,938	194,960	6
2	300,000	.....	.....	.....	50	1,248	.....	.....	3,000	16,200	.....	7
6	600,000	.....	.....	8,000	34	1,622	600	4,680	200	9,634	.....	8
5	1,100,000	.....	.....	20,000	187	2,583	4,972	9,380	23,430	76,770	18,480	9
43	16,805,000	.....	.....	60,000	1,142	1,483	43,080	51,213	28,030	178,894	25,760	10
12	1,097,000	.....	.....	68,000	369	4,114	40,110	46,838	59,465	384,778	24,547	11
10	1,294,200	.....	.....	14,500	161	2,922	63,380	23,207	46,060	178,075	10,587	12
6	360,000	.....	.....	10,000	89	1,713	3,820	2,360	7,260	95,055	.....	13
4	167,000	1	90,000	106,000	79	4,887	14,736	3,960	2,640	71,610	6,600	14
2	600,000	.....	.....	424,000	180	1,261	900	2,200	2,050	19,302	4,130	15
3	460,000	.....	.....	10,000	104	3,389	300	4,840	1,460	61,100	5,280	16
32	8,250,000	.....	.....	5,700,000	448	1,715	1,920	.....	5,400	37,664	.....	17
23	6,402,000	2	10,000	258,500	1,361	4,704	106,728	63,677	52,934	488,677	71,068	18
10	1,065,000	.....	.....	60,000	300	606	36,474	13,758	21,060	151,061	12,142	19
11	3,425,000	.....	.....	48,000	215	861	1,000	2,500	15,330	71,774	.....	20
6	1,500,000	2	500,000	45,000	487	2,971	5,004	8,541	18,170	63,839	6,600	21
6	1,575,000	.....	.....	60,000	132	2,585	33,000	4,800	34,167	77,542	300	22
7	801,000	.....	.....	31,000	62	4,252	33,361	21,544	4,875	40,607	10,560	23
25	4,650,000	2	400,000	600,000	389	1,252	12,978	5,734	11,714	114,977	660	24
120	42,003,000	2	88,000	7,679,000	2,579	619	44,090	79,214	90,525	384,506	112,610	25
2	125,000	.....	.....	.....	31	1,320	5,280	11,220	11,220	15,840	13,200	26
17	1,745,000	4	600,000	27,500	671	2,379	53,077	29,621	81,631	563,121	6,675	27
.....	.....	.....	.....	600,000	26	2,640	.....	.....	.....	5,280	.....	28
66	7,031,000	.....	6,000	203,244	687	3,184	43,688	14,325	45,310	385,419	21,223	29
5	1,130,000	.....	.....	.....	288	170	20,764	32,054	21,807	83,939	2,640	30
8	850,000	2	1,000	5,500	112	3,456	24,434	7,691	13,267	52,736	.....	31
.....	.....	.....	.....	190,000	50	1,675	17,040	9,943	19,602	39,393	.....	32
7	385,000	.....	4,000	28,000	33	3,343	2,660	2,462	1,500	54,454	2,640	33
2	300,000	.....	.....	.....	53	580	.....	.....	10,680	29,180	.....	34
.....	.....	.....	.....	.....	32	3,667	5,280	.....	.....	16,346	.....	35
1	20,000	.....	.....	.....	39	5,220	1,200	650	100	17,040	625	36
9	1,280,000	.....	.....	26,000	267	2,463	37,000	20,056	27,102	117,333	3,000	37
21	4,380,000	.....	.....	6,000	385	2,389	12,400	9,439	14,020	207,908	16,748	38

TABLE 2.—CAPITAL STOCK, IMPROVEMENTS, CHARACTERISTICS OF MACHINERY AND PLANT, GAS SOLD, NUMBER

	STATES AND TERRITORIES.	STREET MAINS—continued.									
		Diameter (inches)—Continued.									
		3	4	5	6	8	10	12	14	16	18
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
1	The United States	18,298,884	14,533,943	983,943	8,455,236	2,389,847	1,405,819	1,546,686	188,403	646,601	103,609
2	Alabama	60,308	95,508	2,640	44,784	22,264					
3	Arkansas	137,450	27,827	2,311	21,266	6,995	400				
4	California	549,278	578,939	8,140	213,375	81,984	70,928	135,408		52,972	1,320
5	Colorado	97,572	88,441	34,680	29,777	30,652	26,910	10,858	3,983	7,056	
6	Connecticut	531,829	235,745	51,480	172,259	52,310	56,041	29,523	15,840	29,240	
7	Delaware	146,267	37,937		36,369	14,495	7,750	3,180		50	
8	Florida	76,195	48,138	640	28,475	9,005	3,500	75			
9	Georgia	248,465	215,131	47,520	99,930	32,210	30,110	37,385	5,200	5,000	
10	Illinois	438,408	324,320	10,860	156,826	39,769	20,564	30,240		5,280	
11	Indiana	821,047	291,054	20,160	163,049	28,080	24,957	2,640		16,843	
12	Iowa	261,013	153,983	14,500	68,138	16,455	5,600	7,000	5,054		
13	Kansas	169,684	120,367	1,320	41,737	18,654	8,736	2,640			
14	Kentucky	147,875	105,269	10,560	53,117	3,640		2,000			
15	Louisiana	297,787	403,144	1,103	128,924	47,921	4,000	22,400	900	12,700	
16	Maine	267,879	133,545	34,320	65,599	14,581	12,039	9,566	1,000	1,009	
17	Maryland	604,658	1,089,307		266,789	87,912	58,449	83,952		30,307	
18	Massachusetts	3,065,809	1,391,536	23,393	1,200,328	258,098	141,570	185,330	6,076	31,450	31,400
19	Michigan	497,950	485,901	5,280	157,162	42,294	37,654	14,207		14,303	
20	Minnesota	306,654	398,105		199,001	78,643	28,261	16,820		14,728	
21	Missouri	764,721	878,986	4,260	423,181	148,411	93,419	76,981		31,343	
22	Nebraska	147,670	230,235		83,318	30,393	14,850	40,520			
23	New Hampshire	102,278	64,602	13,580	17,592	7,665	4,491	8,757	1,200	500	
24	New Jersey	746,667	637,693	26,760	289,659	63,634	81,443	53,803		7,450	
25	New York	3,376,385	3,387,030	88,509	2,923,105	802,837	327,682	501,244		244,931	29,700
26	North Carolina	59,400	38,280	2,640	7,920						
27	Ohio	1,260,703	758,061	89,872	386,624	140,683	94,762	38,681	15,060	12,060	
28	Oregon	5,280	68,640	26,400	18,480	5,280	5,280	2,640	2,640		
29	Pennsylvania	1,408,478	984,920	66,927	399,050	63,272	66,078	66,095	3,780	34,330	16,325
30	Rhode Island	368,446	264,519	168,400	205,416	54,696	66,864	63,349	50,160	29,230	3,744
31	Tennessee	193,213	164,220	21,120	84,421	11,965		20,434		750	
32	Texas	76,085	81,234		10,148	8,430	3,000	800			
33	Vermont	58,203	43,199	2,640	9,825						
34	Virginia	136,940	26,680		49,100	9,840	15,500	1,000	1,000	500	
35	Washington	69,393	43,203	7,080	25,313	262	232	5,518			
36	West Virginia	36,960	74,545	600	63,580			5,280		10,560	
37	Wisconsin	348,581	159,404	14,128	77,777	6,006	8,868	1,988			
38	All other states and territories	473,353	404,295	182,120	233,622	149,911	85,881	66,372	76,560	54,018	21,120

OF CONSUMERS, AND CITY CONSUMPTION, GAS MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

STREET MAINS—continued.							CONSUMERS' METERS.								
Diameter (inches)—Continued.					Increase during year.		Total number in use.	Sizes (lights).							
20	24	30	36	Not specified.	Miles.	Feet.		0	1	2	3	5	10	20	30
Feet.	Feet.	Feet.	Feet.	Feet.				Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.
395,983	171,599	153,446	652	7,087,523	416	2,602	995,619	110	2,221	30,475	438,017	162,833	57,287	18,333	5,966
					4	2,580	2,211				1,498	566	76	26	12
							1,661		9	47	1,061	322	119	44	25
1,320	15,840			541,048	19	1,897	37,121		35	142	19,333	10,802	5,109	929	166
7,331	10,000	4,000			9	4,577	6,142			19	4,952	696	270	102	38
				100,320	6	3,288	15,870			293	8,705	3,152	1,393	709	498
						4,886	5,413				2,940	1,585	505	164	31
					1	483	1,486			20	869	410	96	44	17
				135,960	3	3,494	9,581			14	3,725	1,700	354	149	44
				4,677,999	73	3,624	89,357	10	5	374	13,919	19,519	2,619	988	312
				28,866	4	4,270	19,463	25	105	136	12,741	4,592	993	412	182
					7	3,230	8,276		5	214	5,740	1,490	518	144	57
						1,989	3,799		7	56	2,774	694	186	28	14
					1	682	4,312	75	105	395	2,743	593	191	79	44
4,200					1	3,450	12,440			430	6,424	3,300	1,349	555	154
						2,500	6,394		20	183	3,896	1,389	485	121	71
72,919	19,958	7,920			11	1,812	41,671			5,730	20,983	8,308	5,135	364	236
11,902	18,321	42,487			48	2,088	103,604		5	4,703	59,537	20,791	11,318	4,126	686
16,220				79,200	6	2,332	16,377		110	678	9,334	3,637	815	355	154
2,575	670				27	453	10,277			1,054	5,437	2,526	712	319	193
7,120	6,795			36,960	23	1,045	30,952		1,000	3,062	12,746	6,620	4,187	664	677
2,750					14	3,704	5,579			10	2,383	2,355	370	119	208
						2,908	7,606		148	1,433	3,951	985	437	279	63
2,000					16	685	35,780		5	189	23,574	7,746	2,344	910	289
203,411	65,759	59,411		896,790	63	1,537	338,155		77	648	104,442	27,944	9,295	3,194	971
							1,804			12	1,409	213	82	55	8
14,628					12	1,713	45,545		89	1,618	22,723	7,681	2,131	591	181
					1	1,320	2,135				1,000	420	315	200	50
1,522	6,434	3,268	150		9	5,209	47,968		86	1,369	34,969	6,781	2,527	900	258
31,680	21,120	31,480	502		7	4,371	19,304		15	1,860	11,076	4,906	585	429	69
565					9	1,440	8,316			200	4,492	2,760	471	259	31
						4,119	2,412		25	126	1,543	411	145	80	39
						3,031	1,824			113	1,161	339	112	59	9
						3,140	3,838			15	2,289	966	269	139	53
					5	556	1,921				1,181	410	225	58	15
							3,490				2,769	442	170	59	7
				590,380	10	3,500	14,718		60	250	2,960	1,143	342	216	66
15,840	6,702	4,880			11	1,169	28,817		310	5,082	16,738	4,639	1,037	464	128

TABLE 2.—CAPITAL STOCK, IMPROVEMENTS, CHARACTERISTICS OF MACHINERY AND PLANT, GAS SOLD, NUMBER

	STATES AND TERRITORIES.	CONSUMERS' METERS—continued.															
		Sizes (lights)—Continued.															
		35	40	45	50	60	80	100	125	150	180	200	250	300	400	Not specified.	Increase during year.
		Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.
1	The United States	1,971	1,110	3,399	1,668	2,022	911	2,183	322	653	97	485	159	228	16	265,153	61,513
2	Alabama	1	1	14	.....	12	2	1	.....	1	.....	1	.....	.....	.....	.....	172
3	Arkansas	4	.....	10	4	7	1	5	.....	1	.....	1	.....	1	.....	.....	38
4	California	6	13	94	108	30	12	216	.....	44	.....	60	.....	11	1	10	2,920
5	Colorado	1	2	20	1	19	9	3	.....	5	.....	3	2	.....	.....	.....	127
6	Connecticut	189	169	131	100	107	96	72	52	57	19	29	13	11	.....	75	610
7	Delaware	.....	3	50	.....	53	.....	45	.....	20	.....	.....	15	2	.....	.....	276
8	Florida	.....	5	4	2	11	3	1	.....	2	.....	.....	2	.....	.....	.....	138
9	Georgia	4	3	23	3	17	5	11	.....	4	.....	4	.....	.....	.....	3,521	825
10	Illinois	6	19	164	20	94	11	65	.....	27	.....	15	.....	2	.....	51,188	11,009
11	Indiana	24	54	66	25	57	24	17	.....	1	.....	1	2	5	.....	1	495
12	Iowa	10	11	28	12	19	8	13	.....	3	1	1	2	.....	.....	.....	511
13	Kansas	10	2	8	5	10	1	3	.....	.....	.....	.....	.....	1	.....	.....	214
14	Kentucky	15	30	12	21	8	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	248
15	Louisiana	.....	.....	112	.....	50	22	22	.....	10	.....	.....	10	.....	.....	2	29
16	Maine	10	31	57	26	41	9	16	.....	30	.....	2	1	5	1	.....	96
17	Maryland	85	80	98	40	169	40	183	120	35	15	36	4	10	.....	.....	18
18	Massachusetts	1	9	163	944	186	260	489	4	138	2	133	39	60	3	7	5,048
19	Michigan	78	41	82	14	42	14	16	.....	5	.....	.....	2	.....	.....	1,000	985
20	Minnesota	13	2	40	8	24	5	22	3	2	.....	5	1	1	.....	.....	1,427
21	Missouri	805	152	527	100	74	34	144	65	26	15	25	11	15	3	.....	2,992
22	Nebraska	4	3	38	33	22	.....	20	1	2	.....	11	.....	.....	.....	.....	662
23	New Hampshire	127	31	47	27	21	5	9	11	11	4	13	2	1	.....	1	439
24	New Jersey	25	18	272	6	141	63	121	1	41	.....	13	8	12	2	.....	2,577
25	New York	128	80	716	18	434	108	393	14	124	1	107	27	73	3	189,358	20,591
26	North Carolina	.....	3	10	.....	7	.....	4	.....	1	.....	.....	.....	.....	.....	.....	74
27	Ohio	59	57	168	50	56	29	53	13	11	15	12	4	4	.....	10,000	1,892
28	Oregon	50	25	15	10	20	15	15	.....	.....	.....	.....	.....	.....	.....	.....	.....
29	Pennsylvania	65	72	181	16	149	37	94	4	9	.....	3	2	3	.....	443	1,599
30	Rhode Island	93	58	42	40	13	18	17	19	13	20	6	12	8	3	2	1,086
31	Tennessee	3	4	38	1	8	16	15	1	17	.....	.....	.....	.....	.....	.....	975
32	Texas	21	10	4	.....	6	1	1	.....	.....	.....	.....	.....	.....	.....	.....	159
33	Vermont	4	2	14	1	2	.....	5	.....	3	.....	.....	.....	.....	.....	.....	21
34	Virginia	25	20	30	10	10	2	6	.....	2	.....	.....	.....	.....	.....	2	223
35	Washington	.....	.....	12	.....	13	.....	6	1	.....	.....	.....	.....	.....	.....	.....	394
36	West Virginia	.....	3	11	.....	14	6	8	.....	.....	.....	1	.....	.....	.....	.....	12
37	Wisconsin	45	17	21	4	26	5	15	3	.....	.....	2	.....	.....	.....	9,543	888
38	All other states and territories	60	80	77	19	50	50	56	10	8	5	1	.....	3	.....	.....	1,743

OF CONSUMERS, AND CITY CONSUMPTION, GAS MANUFACTURE, BY STATES AND TERRITORIES: 1890—Continued.

GAS SOLD.										
Total sales.		For illumination.		For power.		For fuel other than for power.		Number of consumers.	City consumption, other than street lighting. (Cubic feet.)	
Cubic feet.	Value.	Cubic feet.	Value.	Cubic feet.	Value.	Cubic feet.	Value.			
32,524,699,855	$46,237,287	32,113,949,939	$45,836,469	73,391,071	$103,420	337,358,845	$297,398	699,323	218,108,846	1
86,459,960	156,001	86,243,160	155,686	.....	.....	216,800	315	902	98,600	2
51,263,000	128,241	51,263,000	128,241	.....	.....	.....	.....	849	2,245,248	3
1,370,608,419	3,003,006	1,355,186,819	2,970,447	7,200,000	14,706	8,221,600	17,853	26,397	1,253,600	4
239,025,000	388,713	238,971,700	388,592	.....	.....	53,300	121	6,225	77,800	5
580,703,482	951,404	573,203,482	939,308	1,200,000	1,626	6,300,000	10,470	11,405	1,618,100	6
126,051,100	158,379	124,551,100	156,742	1,500,000	1,637	.....	.....	5,040	.....	7
43,699,110	107,063	39,867,110	101,750	500,000	1,050	3,332,000	4,863	965	216,000	8
276,114,800	387,851	275,514,800	386,858	425,000	703	175,000	290	7,614	.....	9
3,779,006,230	4,873,825	3,744,681,030	4,821,846	100,000	150	34,225,200	51,829	9,537	29,433,900	10
460,761,100	649,725	452,741,560	637,926	431,100	642	7,588,500	11,157	10,100	2,069,900	11
161,523,700	311,457	153,769,700	296,742	1,300,000	2,600	6,454,000	12,115	5,843	.....	12
95,372,300	167,888	88,615,100	155,623	.....	.....	6,757,200	12,265	2,293	40,200	13
104,458,161	182,464	93,420,180	170,632	8,773,681	8,773	2,264,300	3,059	4,045	20,000	14
200,216,530	641,989	183,887,130	595,375	5,520,000	11,695	10,809,400	34,919	10,390	6,500	15
117,901,560	227,309	117,161,560	225,574	180,000	360	560,000	1,375	2,305	243,000	16
1,157,678,120	1,462,197	1,157,674,620	1,462,191	3,500	6	.....	.....	39,491	.....	17
3,263,293,490	4,760,498	3,259,624,255	4,748,809	5,137,990	6,715	3,531,245	4,974	83,293	36,199,900	18
445,896,400	659,808	440,116,600	653,126	229,000	403	5,550,800	6,279	5,905	1,800,200	19
416,009,810	698,103	415,559,810	697,428	.....	.....	450,000	675	5,068	6,805,000	20
1,065,230,494	1,454,402	1,007,452,894	1,382,945	21,756,400	26,396	36,021,200	45,061	7,713	34,800	21
203,836,600	354,845	203,306,600	353,815	.....	.....	530,000	1,030	4,986	100,000	22
177,399,601	290,993	175,315,101	287,679	.....	.....	2,084,500	3,314	3,644	136,800	23
1,005,685,965	1,690,494	1,003,970,465	1,688,067	80,000	120	1,635,500	2,307	26,909	4,116,700	24
11,503,207,425	15,121,149	11,495,540,825	15,110,898	2,897,900	4,981	4,768,700	5,270	272,859	91,830,648	25
37,174,825	75,973	36,288,125	74,642	436,700	655	450,000	676	105	300,000	26
1,386,579,306	1,613,453	1,349,177,406	1,571,679	8,979,300	9,954	28,422,600	31,820	14,973	6,468,400	27
78,053,800	188,239	78,053,800	188,239	.....	.....	.....	.....	2,000	.....	28
1,417,768,830	1,682,613	1,255,911,430	1,657,831	792,500	965	161,065,000	23,817	70,435	2,786,700	29
579,816,100	596,571	577,816,100	594,071	2,000,000	2,500	.....	.....	4,081	7,780,600	30
247,136,250	420,551	247,136,250	420,551	.....	.....	.....	.....	3,596	6,406,800	31
124,281,414	294,946	120,281,414	287,146	900,000	1,530	3,100,000	6,270	2,757	236,000	32
33,013,600	72,384	33,013,600	72,384	.....	.....	.....	.....	952	.....	33
91,319,400	152,891	91,319,400	152,891	.....	.....	.....	.....	2,950	980,000	34
71,342,180	167,472	71,342,180	167,472	.....	.....	.....	.....	1,602	777,050	35
101,718,600	99,297	100,982,600	98,192	688,000	1,033	48,000	72	100	.....	36
486,437,610	624,426	485,777,610	623,106	360,000	720	300,000	600	13,069	5,651,000	37
933,655,483	1,420,067	929,211,483	1,411,965	2,000,000	3,500	2,444,000	4,602	28,925	8,375,400	38

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